EERING
RARY

NOV 2 0 1945

November 1945

CONSUMERS' RESEARCH

CONTENTS

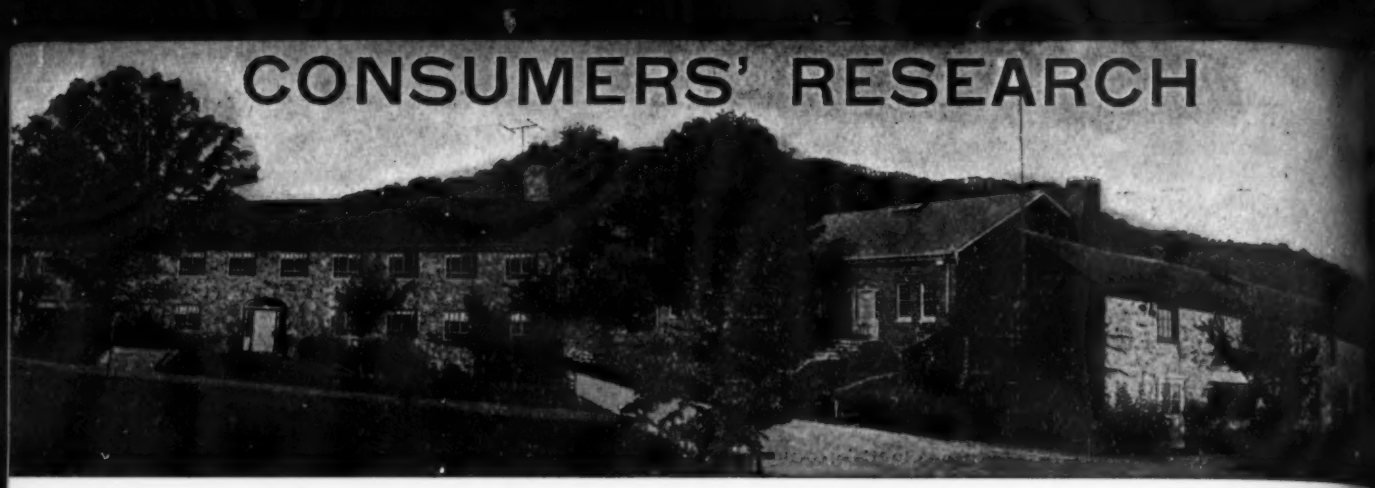
Clothing
Women's Slips 5
Men's Suits 15

For the Home
Panel Heating 9
Boiler Water Treatment 14

For the Automobile
Automobile Radiator Cleaners 19

Miscellaneous
Traces of Things in Relation to Life and Health — II 18
Binders for CR's Bulletins 26
Brief 1945 Cumulative Index 26

Features
Off the Editor's Chest 2
The Consumers' Observation Post 3
Ratings of Motion Pictures 27
Phonograph Records .....Walter F. Grueninger 31



Vol. 16 • No. 5 **BULLETIN** November 1945

Off the Editor's Chest

IN 1923, a 60-watt *Mazda* light bulb sold for 40 cents. Today it is priced at 10 cents (plus war tax), a reduction of 75 percent; and a further very important factor is that improvement in design made as a result of lamp manufacturers' research has resulted in an increase of efficiency over the 1923 model lamp amounting to about 50 percent, according to current advertising literature of a leading lamp manufacturer. In these days, when high government officials are making considerable fuss about the need for public support of their price control policies in order to prevent disastrous inflation, it looks as if the lamp manufacturers who now produce light bulbs with such striking economies in production cost and operation have written a pretty convincing argument for letting industry work out its own price policies for the reconversion period by the competitive process normal to American manufacturing and distribution. Solving the problem in that way would result in benefits to the consumers' pocketbooks and marked savings in tax money (of which government agencies pour out many millions of dollars for their myriad controls over production, distribution, and marketing).

To check up on similar trends on other items, we looked up some of CR's earlier reports on mechanical refrigerators. In 1932-1933 issues we found, among the *A. Recommended* refrigerators: a *General Electric*, priced at $180 for a 3.96 cu. ft. model; a *Frigidaire*, priced at $170 for a 4.5 cu. ft. model; a *Coldspot*, priced at $180 for a 4.58 cu. ft. model. Coming down to the last report before production on civilian goods was suspended for war work, the September 1941 Annual Cumulative Bulletin listed among the *Recommended* refrigerators: a *General Electric* refrigerator, priced at $110 for a 6.3 cu. ft. model; a *Frigidaire*, priced at $148 for a 6.6 cu. ft. model; and a *Coldspot*, priced at $120 (plus freight) for a 6.2 cu. ft. model.

The average cost for electric current per month calculated at 5 cents per kilowatt hour, was $2.60 for all the refrigerators listed in 1932-1933. In CR's 1941 report, the average operating cost was down to $1.10 per month, equivalent to a saving of *about sixty percent* in cost of electricity to operate. The best refrigerator in the 1941 test had a monthly operating cost of only 90 cents. (To make comparisons easier to follow, prices and costs have been rounded off so as to avoid the necessity of figuring odd cents.) Note that not only were the prices markedly lower in 1941, but the refrigerators themselves were much larger in capacity. When these two improvements are taken into account, the consumer was given the benefit of an average saving of about 50 percent in first cost, and an average saving of over 70 percent in operating cost (on a per-cu.-ft.-of-storage-capacity basis).

Turning to the field of smaller appliances, consider the comparative prices of electric toasters. The *Toastmaster* Automatic (one slice) toaster, priced at $12.50, was the only one of ten toasters tested to receive an *A. Recommended* rating in CR's January 1931 BULLETIN. In the September 1941

(*Continued on page 25*)

Scientific and Technical Experts and Editors: F. J. Schlink, R. Joyce, M. C. Phillips, A. R. Greenleaf, and Charles L. Bernier. Editorial Assistant: Mary F. Roberts.

Symbols used to indicate sources of data and bases of ratings: A—recommended on basis of quality; AA—regarded as worthy of highest recommendation; B—intermediate with respect to quality; C—not recommended on basis of quality; cr—information from Consumers' Research's own tests or investigations; 1, 2, 3—relative prices, 1 being low, 3 high. Note that price and quality are completely differentiated in CR's listings; **a quality judgment is independent of price**; 44, 45—year in which test was made or information obtained or organized by the staff of Consumers' Research.

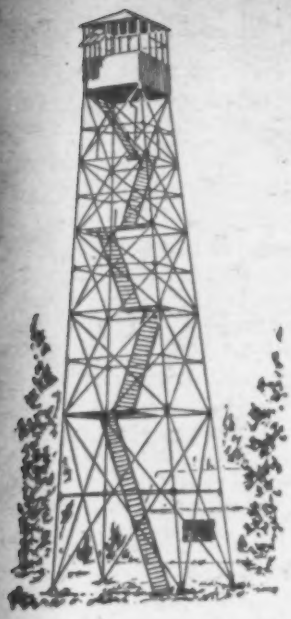
It will be advantageous if you will, whenever possible, send prompt notice of change of address at least a month before it is to take effect, accompanying your notice with statement of your old address with name in full. At least three weeks' notice must be given in any case. This rule, however, regarding long advance notice does not apply to military personnel.

¶*CR will, of course, gladly change addresses for men and women in the services as often as required by changes in station and other circumstances.*

★★★For a brief cumulative index of 1945 BULLETINS preceding this issue, see page 26.

CONSUMERS' RESEARCH BULLETIN, issued monthly by Consumers' Research, Inc. Editorial and Publication Offices, Washington, N.J. Single copy 30c. Subscription price (12 issues) $3 per year, U.S.A., Canada and foreign, $3.50. For libraries, schools, and colleges, a special subscription of nine monthly BULLETINS (October-June, inclusive) is available at $2; Canada and foreign, $2.50. ¶Responsibility for all specific statements of fact or opinion at any time made by Consumers' Research lies wholly with the technical director and staff of the organization. Entered as second-class matter November 9, 1934, at the Post Office at Washington, N.J., under the Act of March 3, 1879; additional entry at Easton, Pa. Copyright, 1945, by Consumers' Research, Inc., Washington, N.J. ●● Printed in U.S.A. ●● CONSUMERS' RESEARCH BULLETIN is on file in many school, college, and public libraries and is indexed in Industrial Arts Index and in the Readers' Guide to Periodical Literature.

Note: THE MATERIAL IN THIS BULLETIN IS PROTECTED BY COPYRIGHT. REPRINTING IS OFTEN PERMITTED, BUT ONLY WHEN SPECIAL PERMISSION HAS BEEN ASKED AND GRANTED IN WRITING.



The Consumers' Observation Post

BACON is difficult to find in some sections these days, but sausage has been plentiful. Of course, the general shortage of hogs has been a factor in the situation, but did it ever occur to you that sausage is made from pork also? The real explanation for the disappearance of cured pork products, according to a report in a mid-west newspaper, is OPA ceiling prices, which make it more profitable to grind pork into sausage than cure it as ham or bacon. During the first seven months of 1945, for example, it is pointed out that U. S. Department of Agriculture meat inspectors inspected (in round numbers) over 1,000,000,000 pounds of sausage and 220,000,000 pounds of bacon as against some 850,000,000 pounds of sausage and 340,000,000 pounds of bacon in 1944.

* * *

WOMEN'S SILK HOSE will be available again by next Spring, predicts one optimistic trade journal. It is expected that silk hose will be priced about the same as nylon at first, but that in a short time nylon hose will be cheaper. Those nylons that were promised for Christmas, however, may not materialize. The trade wants to wait until all dealers are well stocked before risking a shopping mob on their doorsteps. Manufacturers are calling for a trade agreement that would set the first business day in January 1946 as the day the new hose will go on sale. In the meantime the less-sought-after rayon stockings will be scarce because of dwindling stocks of rayon yarn. It looks as if women may have to continue the summer bare-leg fashion until January.

* * *

AMOUNTS OF SURPLUS DRUGS and cosmetics in the hands of the federal government are reported to be enormous. The drug and toilet goods industry is trying to arrange for their repurchase in order to prevent a recurrence of the fiasco after World War I which resulted when speculators and promotors peddled the surplus supplies without retesting to determine their potency and freedom from deterioration and contamination. There are some who will remember the disastrous results from hospital use of ether that had deteriorated from long storage and which caused a number of deaths when administered as an anesthetic. According to announcement, the drug industry plans to test present surplus drugs carefully before they are put on sale.

* * *

SUPPLIES OF MEN'S SUITS are so low that Marshall Field & Co., of Chicago, are urging returning servicemen to bring in for alterations the suits they wore before entering the Armed Forces, to tide over the present period of shortage. At that, the men are likely to have suits of better quality than if they purchased new suits. Men who can wear their old shirts and shorts, too, will be in luck. Only meager supplies of these items are now reaching retailers and the condition is not expected to improve before the first of the year.

* * *

DRIED EGGS have been one of the foods the returning GI wants to see no more of. The U. S. Department of Agriculture hopes, however, that housewives can be persuaded to make use of dried eggs in various dishes, such as cakes, popovers, custards, and other dishes, in order that the surplus of eggs in the spring may be utilized to the best advantage, from the standpoint of prices received by the farmer. To this end the U. S. Dept. of Agric. has just issued

a helpful little booklet of recipes entitled "Cooking with Dried Eggs," which your congressman or senator will undoubtedly be glad to send you free of charge. Just how much saving of bulk and weight is involved in the handling and shipping of dried eggs may be judged by the fact that it takes about three dozen fresh eggs ("large") weighing perhaps 4-1/2 to 4-3/4 lb. to make one pound of egg powder. The economy in use of the processed eggs will vary according to the price of fresh eggs.

* * *

THAT SUIT WITH TWO PAIRS OF TROUSERS which is the most economical buy for the consumer in the lower-income brackets and, indeed, any man who wants to get the most for his money, is, at present writing, the bone of contention between the WPB and the OPA. It seems that the OPA is putting up a strenuous fight to keep the WPB from dropping its wartime ban on the two-pants suit and on the vest worn with the double-breasted suit, because that would immediately bring a request for higher ceiling prices. The OPA, according to one report, simply dreads the prospect of battling with the clothing manufacturers over the correct allowance for these items. In the meantime, clothing dealers reiterate their hope that the two-pants suit will never return. Slack manufacturers, too, are afraid that two-pants suits would cut heavily into their sales.

* * *

PRUNE PASTE has been found an economical and effective ingredient of food for dogs. Experiments by Agnes Fay Morgan and M. Groody of the University of California, reported in the Journal of the American Veterinary Medical Association, showed that the liver vitamin A reserves of the prune-fed dogs were generally higher than controls given the same rations without prunes. Of six pups produced in the second generation group, those fed prunes were superior in rate of growth to those receiving dry rations only. If the findings are directly applicable to human nutrition, it might seem to be desirable to give prunes a more prominent place among the fruits served, particularly at breakfast.

* * *

HOUSEHOLD APPLIANCES are making their appearance slowly. Some stores have samples for inspection, but sizable shipments are not expected before the first of the year, at the earliest. Some stores are accepting orders for the various appliances on display to be filled on a priority basis as stocks are received. Other stores are taking no orders on the exhibited appliances until shipments have actually arrived in their warehouses. An important stumbling block to earlier delivery of needed items has been the failure of the OPA to approve price schedules in certain cases. An enterprising manufacturer who tried to speed up reconversion operations without waiting for formal OPA clearance is now being sued in federal court for selling washing machines to dealers at 25 percent over ceiling price, in spite of the fact that the company had an understanding with the dealers that they would be reimbursed if the OPA fixed the manufacturer-to-dealer ceiling price lower than that he was charging.

* * *

CHEWING GUM, for those who use it, should be back in civilian life soon. The Army and Navy are reported to have good stockpiles and won't need much more at present. The essential chicle is in fairly good supply, but the sugar shortage is holding up the return of gum in quantity.

* * *

POTATOES are so plentiful that it is surprising the government has not sponsored an Eat-More-Potatoes Week. In some sections, they are being offered to farmers at the rate of 40 cents for a hundred pounds to use as cattle feed. Some seventy-five car loads have been stored in those famous cool limestone caves in Kansas which recently housed government purchases of surplus eggs. One business journal reports that a thousand more cars of potatoes are scheduled for the same destination. It is not expected that the potatoes will be released for human food until consumers are willing to pay higher prices than those prevailing at present. All of which is a little confusing to those of us who thought that it was desirable--the OPA's chief mission in life, no less--to keep prices down.

(The continuation of this section is on page 29)

Women's Slips

If you are Christmas-Shopping

Why not select a useful as well as an attractive gift, when buying lingerie? With this report on fifteen slips, even the men of the family will be aided in making a good choice among the popular brands.

It would be difficult to lay down any hard and fast rules for buying slips. Women's buying preferences differ greatly, a fact that is recognized by the trade, which provides the market with a wide variety of designs and styles. It is a fact that is equally clear to the man or the woman who tries to select a slip for a gift for a friend or some member of the family.

It is, of course, important to have a slip made of a material that will keep its good appearance after many washings and ironings. Because of the strain and wear which the garment receives, good workmanship is as important as good materials. But even if materials and workmanship are good, the comfort, serviceability, and attractiveness of a slip will not be satisfactory unless the design is right for the figure.

A slip that does not fit properly may gape at the bust or under the arms, or it may fit too snugly and flatten the bustline. The waist may be too loose and there may be wrinkles and bulges at the waistline, particularly when the wearer is seated. The skirt may hang unevenly. The slip may twist and slide and "ride up." If a slip has any one of these faults to any marked degree, it will be a poor buy (or a poor gift) regardless of its prettiness or its durability.

Buying for Fit

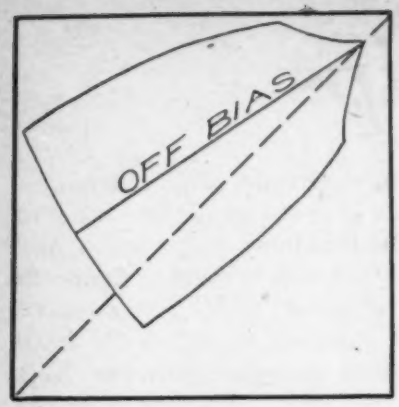
A straight-cut slip is perhaps the best choice for the woman who wants a slip that will stay below the knees and will not sag or twist. (Slips that are cut off center on a straight cut, however, may pull and sag and twist.) Unfortunately, the straight-cut slip has a great disadvantage in that it is not likely to fit well at the waist, and for wear under certain dresses, this might be as objectionable as riding up would be. In addition, there is no "give" at the seams.

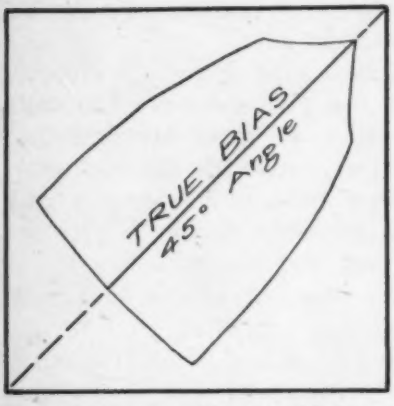
Modifications of the straight-cut slip are many. Some slips are made with one or more of the gores cut on the straight of the materials, while other gores are bias-cut to remove some of the bulkiness at the waist, and to provide a better figure fit and some "give" at the seams. A common style has the front panel straight with the back panel bias. Another style has four gores, alternating bias and straight gores.

Bias slips fit the figure closely but give more trouble with riding up than straight-cut styles, although the four-gore slips are more flexible and tend to give less trouble in this respect than two-gore bias styles. All bias-cut skirts, however, have a tendency to ride up, and if the bias is not true (that is with the material cut and set in at a 45 degree angle), the slip may creep or bunch.

Some slips are styled with

Slip styles—from left to right: Straight front panel and bias back panel. Four-gore alternating bias. Four-gore slip with fagoted seams.





At the bottom, true bias, cut with the pattern at a 45° angle on the material. At the top, off bias. Note that the pattern is not at a 45° angle on the material.

many gores, six, or as many as eight. These slips may fit the figure, but the great number of seams may make the garment bulky and may be objectionable to some women, especially young people or others who prefer to wear their clothes well fitted.

A departure from conventional styles is the *Mary Barron* in which the skirt of the slip is made of one piece of material which is straight at the front of the skirt and seamed at the middle of the back. Although this slip is widely advertised as not riding up, it was found that the model tested did ride up to a certain extent.

These are, however, only a few of the many styles which are offered to consumers. Most women learn to know the particular style or styles that suit their needs and purposes and will buy them.

Aside from fit and "ride-up" features, there are some other considerations that should be given to the design of a slip. The length and the "hang" of the garment should be observed. Some slips are made with "hems" sewn at several places so any surplus length can be snipped. Others have bottom edgings of lace that can be snipped off to the desired length leaving a finished edge on the remaining lace. (Ordinary lace edging at the bottom of a skirt makes length alteration or adjustment difficult.)

Metal buckles or adjustable slides on slip straps provide for some adjustment in length, but it should be remembered that if the straps are pulled up too much, the slip will become ill-fitting and will wear at the underarm.

Fabrics

There was a time when women's fine lingerie was made of cotton. About 1915, however, lingerie made of silk fabrics became fashionable, and now rayon fabrics are by far the most popular. Since a good-quality rayon is attractive and will withstand a good deal of rubbing and friction, it is a very satisfactory fabric for slips. Rayon also takes dye readily, and white rayon will not turn yellow from sunlight or age. Fabrics are made in different lusters and may be given a permanently dull finish by the addition of a colorless pigment to the filament as it is formed.

Rayon yarns are smooth and even, and to avoid their natural tendency to shift, and to insure adequate fabric strength, fabrics should be well balanced (in warp and filling) and of firm construction. Some rayon fabrics are heavily "sized" (finished with a high percentage of

At the left—This is a "social error" according to the ads. The slip is the Mary Barron. *The slip at the right (which did not ride up, except at the seams) is the* Miss Swank.

Yarn shifting. If the yarns shift easily, the fabric will "blister" and wear out quickly. Yarn shifting is a failure which greatly shortens fabric life, and shifts may increase in number and size when finishing materials (including sizing) are removed in washing.

sizing or loading material) to give the cloth the appearance of better quality and heavier weight. Yarn shifting, although it may not appear in the unwashed fabric, may occur as finishing materials are removed by washing and may increase after additional washings. Excess loading of a fabric with sizing that will be removed in washing is, of course, undesirable, and the fabrics of the slips tested and examined were tested to determine the percentage of sizing present. Yarn shifting was tested on a machine especially constructed for this purpose both on new and on washed samples of the fabrics.

Workmanship

Poor or careless workmanship can make even a slip of good materials and design a poor purchase. Fortunately for the buyer, poor workmanship is usually obvious and can be easily seen by merely examining a slip on the counter.

Seams should be straight, flat, and even, and evenly stitched. The finer the stitching, the less likely the seam is to run if a thread breaks. Stitches may be as fine as 22 to an inch, although long, loose stitches (sometimes less than 10 to an inch) are found on poor quality garments. The thread should be the right weight for the fabric; too coarse thread may cause tiny holes that will weaken the fabric, too fine thread will be likely to break.

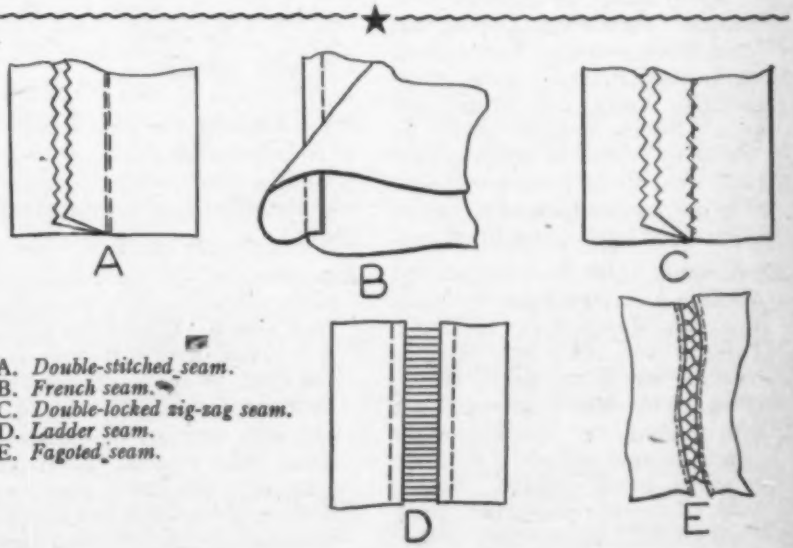
There are many different kinds of stitches used in seaming slips, but the most common one found on the garments examined was the double-locked zig-zag stitch. This stitch is firm and gives the seam greater elasticity than other kinds. Other common seams are the French seam (seam within a seam), the fagoted seam (which is decorative as well as "elastic"), and the double-stitched seam. This last seam, in which the seams are pinked and then stitched a second time from the right side are satisfactory on bias seams, but are apt to pull out if the seams follow the lengthwise or crosswise yarns of the fabric.

Shoulder straps are best if made of a double fold of the fabric stitched on both edges. Ribbon straps, or fabric straps stitched once and then turned, do not last well. If there is lace at the top of the slip, the straps should be attached to the fabric below the lace as well as to the lace edge.

CR's Tests and Examinations

The tests made on the slips reported included those which would give an indication of the workmanship, construction, and quality of the garment as well as the serviceability and durability of its materials and fabric.

The fabrics were critically examined and measured for the following qualities: satisfactory thread count, breaking load, colorfastness, and resistance to yarn shifting. The yarn slippage test was made on a special instrument devised for this purpose by the United States Testing Co. of Hoboken, N.J. (a leading textile testing laboratory). This instrument comprised rubber jaws so arranged and loaded that a measured pressure could be exerted on the fabric between them, the load being adjusted according to the type of fabric being tested. A maximum yarn shift pro-



A. *Double-stitched seam.*
B. *French seam.*
C. *Double-locked zig-zag seam.*
D. *Ladder seam.*
E. *Fagoted seam.*

ducing an opening of 0.1 inch, under the load applied, was considered permissible. The slippage determination was that of the warp threads across the filling threads. The fabrics were tested in the original condition and after three launderings. Determinations were also made for the amount of sizing and the amount of shrinkage in washing.

In addition, the designs of the slips were critically studied, with special attention being paid to cut, fit, and freedom from "riding up." Test results are summarized in the listings.

Colored fabrics were tested for colorfastness to washing and perspiration. All were satisfactory with respect to perspiration, and all except those mentioned otherwise in the listings were satisfactorily colorfast to washing. Yarn-shifting tests were made on all fabrics, and all were found satisfactory except as noted.

Ratings are cr45.

A. Recommended

Artemis (Weil-Kalter Mfg. Co., Louderman Bldg., St. Louis) $2.48. Tea rose *Bur-Mil* rayon crepe-back satin. Thread count of fabric, 285 x 95. Average breaking strengths of fabric: warp, 68 lb.; filling, 50 lb. Little shrinkage of garment with washing. Percentage of sizing material, below average. Fabric, good. Garment construction, good; workmanship, seams, and straps, also good. Styling and fit, good; no "riding up" owing to design of two-panel skirt (front panel on straight of fabric, narrow back panel cut on bias); front bust section fitted well.

Miss Swank (Miss Swank, Inc., 112 Madison Ave., New York 16) $2.93. Tea rose *Bur-Mil* rayon crepe. Thread count, 154 x 101. Average breaking strengths: warp, 47 lb.; filling, 40 lb. Shrinkage of garment with washing, fair in warp; slight gain in filling direction. Percentage of sizing, below average. Fabric, good. Garment construction, good; workmanship, seams, and straps, good. Styling and fit, good; little "riding up" except at seams; good fit at hips and bust.

Shar-Loo (Trillium, 136 Madison Ave., New York 16) $3.95. Tea rose *Bur-Mil* rayon crepe. Thread count, 153 x 110. Breaking strengths: warp, 46 lb.; filling, 40 lb. Little shrinkage of garment with washing. Percentage of sizing, below average. Fabric, good. Garment construction, good; workmanship, seams, and straps, good. Styling and fit, good; no "riding up," owing to design of straight cut of front skirt panel with small bias back panel. In spite of lastex inserts, there was loose fit under the arms.

Suzette, No. 2648 (S & Z Mfg. Co., 230 Franklin St., Chicago 6) $2.25. Tea rose rayon satin. Thread count, 285 x 96. Breaking strengths: warp, 58 lb.; filling, 46 lb. Little shrinkage of garment with washing. Percentage of sizing, below average. Fabric, good. This fabric showed up better than all others examined in yarn-shifting test. Garment construction, good; workmanship, seams, and straps, good. Styling and fit, good; little "riding up," good fit at bust. Skirt is hemmed so bottom can be cut off to two other lengths if original length is unsatisfactory.

Textron Lingerie (Textron, Inc., 350 Fifth Ave., New York 1) $3. White rayon crepe. Thread count, 157 x 111. Breaking strengths: warp, 42 lb.; filling, 47 lb. Some shrinkage in warp direction with washing, a little gain in filling direction. Percentage of sizing, below average. Fabric, good. Garment construction, good; workmanship, seams, and straps, good. Styling and fit, good; little "riding up," fitted well at waist and bust.

* * *

The following two slips were judged to be less desirable as to styling and fit and in one or more other respects than the others in the *A-Recommended* group.

New Form, No. 721 (Manhattan Undergarment Co., Inc., 36 E. 31 St., New York 6) $2.98. Tea rose *Bur-Mil* rayon crepe. Thread count, 154 x 108. Breaking strengths: warp, 48 lb.; filling, 40 lb. Some shrinkage with washing. Percentage of sizing, below average. Fabric, good. Garment construction, good; workmanship good, seams and straps better than average. Styling and fit, fair; seaming had tendency to pull up and ripple when garment was worn. The garment was too large for marked size; would fit size 36, although marked size 34.

Seamprufe (Seamprufe, 148 Madison Ave., New York 16) $2.95. Tea rose *Bur-Mil* rayon crepe-back satin. Thread count, 154 x 106. Breaking strengths: warp, 47 lb.; filling, 47 lb. Little shrinkage with washing. Percentage of sizing, above average. Fabric, good. Garment construction, better than average; workmanship poor, seams and straps good. Styling and fit, fair; little "riding up," good fit at bust, but baggy around waist.

B. Intermediate

Corette (Custom Undergarment Corp., 148 Madison Ave., New York 16) $3.25. White *Bur-Mil* rayon crepe-back satin. Thread count, 255 x 107. Breaking strengths: warp, 55 lb.; filling, 35 lb. Little shrinkage with washing. Percentage of sizing, above average. Fabric, good. Garment construction, good; workmanship, seams, and straps, good. Styling and fit, poor; two-piece bias skirt rode up above knees, back bodice and wide lace-trim sections at bodice top fit poorly. Would have received an *A* rating if fit had been better.

Mary Barron, Biastrait (The Davidson Bros. Corp., 180 Madison Ave., New York 16) $2.98. Tea rose *Bur-Mil* rayon crepe. Thread count, 155 x 100. Breaking strengths: warp, 45 lb.; filling, 66 lb. Some shrinkage after washing. Percentage of sizing, below average. Fabric, good. Garment construction, better than average; workmanship, seams, and straps, good. Styling and fit, poor; some "riding up," waist and bust did not fit well. Garment was equal to a size 34 although marked size $\frac{31½}{14}$. Would have received an *A* rating if fit had been better.

Radelle, Sylfit (Radelle Lingerie Co., 185 Madison Ave., New York 16) $2.98. Tea rose *Bur-Mil* rayon crepe-back satin. Thread count, 254 x 108. Breaking strengths: warp, 58 lb.; filling, 36 lb. Little shrinkage after washing. Percentage of sizing, above average. Fabric, good. Garment construction, poor; workmanship poor, seams and straps fair. Styling and fit, good; little "riding up," good fit at bust and waist.

C. Not Recommended

Barbizon, Jaunty Rite (The Barbizon Corp., 145 Madison Ave., New York 16) $2.25. Tea rose crepe-back satin, "A Barbizon Woven Fabric." Thread count, 254 x 113. Breaking strengths: warp, 53 lb.; filling, 38 lb. Little shrinkage with washing. Percentage of sizing, above average. Fabric, poor. Yarns of fabric shifted to an objectionable degree after washing. Garment construction, better than average; workmanship good, seams and straps fair. Styling and fit, fair; some "riding up," too long and too large around waist for size 36 (marked size), midriff section did not fit well.

8-Gore, No. 6045 (Martha Maid Mfg. Co., 367 W. Adams St., Chicago 6) $2.30. White rayon satin. Thread count, 199 x 72. Breaking strengths: warp, 50 lb.; filling, 26 lb. Little shrinkage in warp direction with washing, slight gain in filling direction. Percentage of sizing, above average. Fabric, poor. Yarns of fabric shifted to an objectionable degree as received and after washing. Garment construction, poor; workmanship poor, seams and straps poor. Styling and fit, poor; no "riding up," but bodice, bust, and midriff sections did not fit well.

Lady Pembrooke (Pembrooke Lingerie Co., 152 Madison Ave., New York 16) $2.25. Tea rose rayon satin. Thread count, 199 x 70. Breaking strengths: warp, 58 lb.; filling, 23 lb. Little shrinkage after washing. Percentage of sizing, above average. Fabric, poor. Garment construction, fair; workmanship poor, seams and straps fair. Styling and fit, poor; some "riding up," bodice not bilaterally symmetrical, too large, especially at midriff section. Garment was large for a size 34, small for a size 36.

Powers Model (Louis Herman & Co., 159 Madison Ave., New York 16) $1.79. Tea rose rayon. Thread count, 93 x 67. Breaking strengths: warp, 50 lb.; filling, 49 lb. Large amount of shrinkage with washing. Percentage of sizing, below average. Fabric, fair. Garment construction, fair; workmanship, seams, and straps, fair. Styling and fit, poor; considerable "riding up," was tight in fit and short for a size 36 (marked size).

Tru-Form by Miss D. Benay (Du Benay Undergarment, Inc., 102 Madison Ave., New York 16) $2.98. White rayon satin. Thread count. 215 x 84. Breaking strengths: warp, 43 lb.; filling, 24 lb. Little shrinkage with washing. Percentage of sizing, above average. Fabric, poor. Yarns of fabric shifted to an objectionable degree both as received and after washing. Garment construction, fair; workmanship, seams, and straps, fair. Styling and fit, fair; considerable "riding up," bias cut under arms cupped out and made poor fit, full length front and back panels eliminated seam at waist but made for poor waist fit.

Panel Heating

IF MATERIALS and labor are available at sufficiently low costs that the anticipated boom in post-war home building can be fulfilled, there will be a great deal of interest in heating systems, particularly those of the newer types that promise to relieve the consumer of some of the inconveniences and deficiencies of the heating plants now commonly available. One new system of heating that is perhaps most talked of now is called *Panel Heating*. Discussions in this field are very much beset with confusion since not only consumers but manufacturers, who should know better, often give the system the incorrect name of *Radiant Heating*. Before considering panel heating, it would seem advisable to define both types of heating.

Panel Heating involves relatively large areas of walls or floors, or panels which are heated by means of embedded pipes *to a relatively low temperature (not over 130°F)*. By this method the heat is supplied to the air of the room not only by radiation (amounting to 55% in case of floor panels) but to a large extent by convection (45% in case of floor panels). By way of contrast, the radiant heating effect from a panel at 110°F is only about four-tenths of one percent (0.4%) of that from a true *radiant heater* with a high-temperature (1200°F) surface.

High-Temperature Radiation, known among heating engineers by the shorter term, Radiant Heating, involves direct exposure of the occupied parts of the room to radiation emitted from relatively small heating units at very high temperatures (perhaps 1000°F). Open fireplaces, electric coil heaters, and even the old pot-bellied stoves can be considered as examples of radiant heaters. This type of heating unit is not very satisfactory because of the unevenness of the effect. Different parts of the body of an occupant of a room heated by radiant heating would be at different levels of temperature and so would often be quite uncomfortable.

In one example of radiant heating recently described, small medium- or high-temper-

ature panels are heated by gas or electricity. One of these using gas is available in three capacities, 10,000, 20,000, and 30,000 Btu's and in various sizes (two are 5 ft. x 1 ft., 5 ft. x 1½ ft.). Such heating units come ready for installation in any wall sufficiently thick to provide the needed space, say 4 inches or more.

In British experience it was found that except in very high-ceiling rooms where high-temperature panels can be installed up close to the ceiling and inclined at an angle directed across the room, the effect due to the localized temperatures of the radiant units can be very unpleasant to people who are at a distance not beyond four feet from the panel.

Panel heating is not new but dates back to the Roman era when heating was done by warming the floors of dwellings. Panel heating was first introduced in England in 1908, hot-water pipes being embedded in the plaster of the walls, but the modern development of this type of heating has occurred mostly within the past fifteen years, with the greatest impetus in England and on the continent under the relatively mild winter conditions there prevailing. The lounge of the liner Queen Mary is equipped with a panel heating system.

In the field of heating, ventilating, and air conditioning, the history of new developments follow a familiar pattern like this: (a) an idea develops; (b) a few trial installations are made; (c) wide publicity is given the "new and revolutionary" scheme; (d) laboratory workers and theoreticians expound complex theories and propose complicated equations; (e) as more installations are made the practice is found to be simpler than the complex theories propounded for it; (f) the design and installation gradually become standardized; (g) the "new" system falls into its niche as a practical and accepted system.

The development of the panel heating system has been following this pattern and is now at stage "f." The next five years will be critical, and if designers and promoters work carefully and make few mistakes and so avoid giving the new method a bad name with consumers, this method of heating will have definitely arrived on the scene, with a promising future.

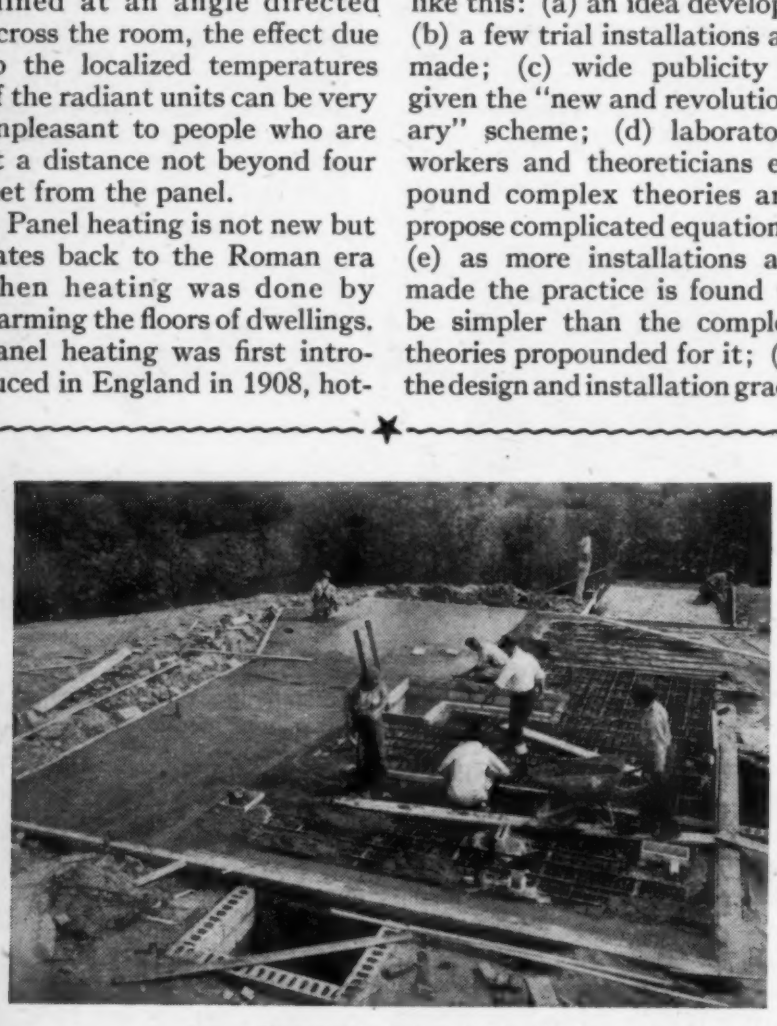


Illustration by courtesy of A. M. Byers Company, Pittsburgh.
Figure 1

Example of panel floor heating in a residence with partial basement. The floor is supported by steel joists, metal lath being placed over the joists to serve as a form for the concrete. The heating pipes are laid on the lath. In the unexcavated portion (seen in the rear) the floor coils were laid on a layer of a material called Haydite *"popcorn" (a light fill consisting essentially of burned clay and shale, and serving as an insulator between the pipes and the ground). The pipes are then covered with concrete. Second floor rooms are heated by coils in the ceiling of the lower floor.*

Methods Used for Panel Heating

I. The most common type is one in which 1½ inch diameter hot-water pipes are placed below the floor (not embedded) and connected to a forced-feed (circulating pump) heating system. (When the pipes are embedded in the floor, smaller pipes of ¾ inch or 1 inch diameter 6 to 9 inches apart are used.)

If the heat loss from the room is very large, as will occur in very severe climates or where the construction of the building is poor or storm windows and other heat-conserving equipment are lacking, it may be necessary to install additional heating panels in the walls and ceilings. The hot-water pipes are usually wrought iron or copper made tight by welding or soldering, and tested under high pressure before being buried in concrete or plaster. Up to the present time, there is no evidence available as to whether heating pipes embedded in concrete or plaster may corrode from external conditions, or may be choked up by lime deposits contained in hard water, and so interfere with free circulation of the heating med-

ium and ultimately require replacement. So far, there would appear to be no particular reason to expect this type of difficulty. On the other hand, if leaks should develop, the results could be serious and might require rather drastic and expensive operations on the piping and connections or even the installation of radiators, as a means of heating to replace the floor or wall piping that had gone out of use through the breakdown of piping or connections.

II. System II is similar to I except that the heating pipes are installed in the walls and ceiling and are of smaller diameter (½ inch or ¾ inch). When pipes are installed in cold exterior walls they must be properly protected by insulation, to protect them from freezing and to reduce the loss of heat to the outside of the house. Insulation must be provided with ceiling pipes to reduce the transmission of heat to the floor above, for while a warm floor in a bedroom would be considered an advantage, it would tend to be uncomfortable if its surface temperature reached 85°F or higher.

III. Warm air ducts of hollow tile installed under the floors, floor containing steel channels, or other means of providing air spaces below the floor, with the warm air kept in motion by means of a circulating fan.

IV. Hollow channels carrying warm air behind the surfaces of walls and ceiling. Many ingeniously devised installations have been tried and others will undoubtedly be developed. IMPORTANT NOTE: Because of the increased fire hazard occasioned by the presence of any combustible material in the air channels, in walls and ceilings, and floors, certain special precautions need to be taken, and it would be most essential that installations of this type should conform to specifications and restrictions imposed upon them by the Underwriters' Laboratories and other qualified fire-protection authorities.

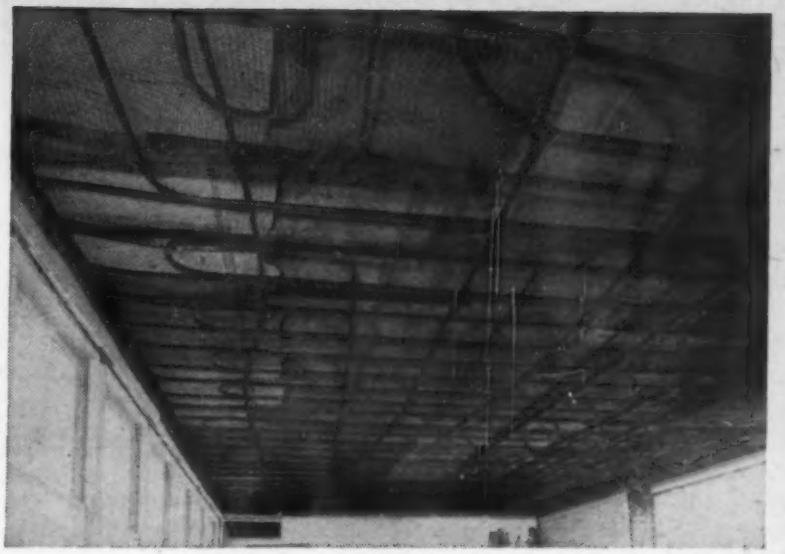


Illustration by courtesy of A. M. Byers Company, Pittsburgh.
Figure 2

A ceiling installation to heat the room below, in which the pipes are tied to 1½ inch channels anchored to the ceiling beams. Metal lath, on which the finished plaster ceiling is to be applied, is then fastened below the pipes.

★

It is certain that several types of electrically heated panels will be offered. One form reported a few years ago consisted of fine wires between sheets of strong asbestos paper, in principle very much like the ordinary electric heating pad. The asbestos paper was intended to be glued to the wall like wallpaper and then painted or papered as desired. Unless in very mild weather or semi-tropical climates, the electric-heating method would be out of the range of practicability from the standpoint of operating cost, except in regions where the cost of electricity per kilowatt hour is something under a cent.

Advantages and Disadvantages of Panel Heating

1. The space that would normally be given to unsightly radiators, floor grilles, or baseboard registers can be utilized to the best advantage for the convenience of the occupants and for the most suitable arrangement of furniture.

2. Because of the use of large heated panel surfaces the air temperature throughout the room, if the system is well designed, is very uniform, maximum differences in temperature at different parts of the room being on the order of about 5°F, but with the lower temperatures at the ceiling, whereas in conventional systems the temperatures at the floor level are 2° to 10°F lower than at the ceiling of the room.

3. Panel heating appears to be well adapted to houses without basements, in which a concrete floor slab is laid on top of

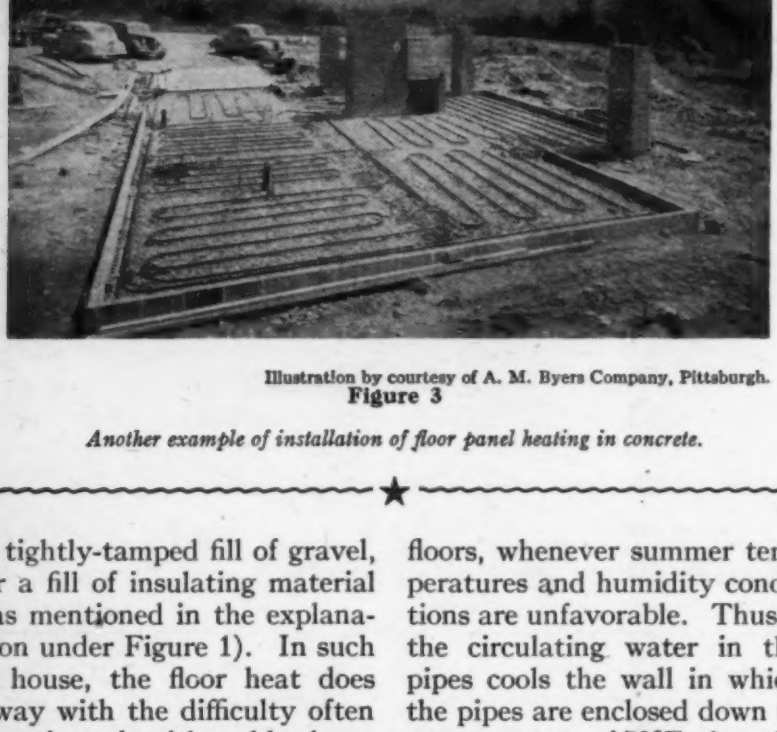


Illustration by courtesy of A. M. Byers Company, Pittsburgh.
Figure 3

Another example of installation of floor panel heating in concrete.

★

a tightly-tamped fill of gravel, or a fill of insulating material (as mentioned in the explanation under Figure 1). In such a house, the floor heat does away with the difficulty often experienced with cold, damp concrete floors.

4. Panel heating can be designed to utilize commercially available equipment.

These advantages would in themselves be sufficient to persuade many people of the desirability of the panel heating system, but the sales promotion men, with their usual flair for pseudoscientific nomenclature and exaggeration have added untenable claims of "infrared radiation," "solar radiation effects," unusual fuel savings, some as high as 30%, and claims that the systems can be used effectively for cooling in summer. As far as can be seen at present, there appears to be little practical application of panels to comfort cooling in summer, as cold water circulated through pipes for cooling will result in heavy condensation of moisture on the surfaces of the walls, ceilings, or floors, whenever summer temperatures and humidity conditions are unfavorable. Thus if the circulating water in the pipes cools the wall in which the pipes are enclosed down to a temperature of 70°F when the room temperature is 86°F and the relative humidity in the room is 61%, moisture would begin to be deposited from the air of the room upon the wall and this deposit would increase rapidly as wall temperatures fell further below the dew point (as they would necessarily in order to produce effective cooling of the room). As for "solar radiation effect," direct analogies of radiation effects between a low-temperature panel and the sun are far-fetched and grossly misleading. Even a high-temperature surface at 1200°F (about the temperature of molten aluminum or magnesium), gives only about two-tenths of one percent (0.2%) as much radiation as the sun, and a low-temperature panel would of course radiate considerably less.

* * *

The greatest disadvantage of panel heating is the difficulty in controlling temperatures and avoiding overshooting of the correct temperature. Large surfaces, particularly concrete floor slabs, take a long time to cool after they have been brought up to the required temperature. Thus an appreciable time lag will occur before the thermostat operates again, resulting in wider than normal variation of temperature at different times, with no change in the setting of the thermostat. This might in some cases be unobjectionable; in others, sufficient to cause some dissatisfaction with the heating.

Operating Characteristics

The air temperatures required for comfort in a panel-heated home are close to 70°F, *and are not materially different from those for conventional systems.*

No convincing evidence exists that the fuel consumption for a panel system will be materially higher or lower than that of one of the conventional systems comparably well installed in a similarly well-built house.

Some cases have been reported in which a heated concrete floor slab maintained uniform room temperatures during cold weather, but produced overshooting or temporary excessive room temperatures during the sudden temperature changes frequently encountered in fall and spring weather. This effect may be determined to a degree by the heat-storage capacity of the floor, and by the thermostat arrangement used, and certain characteristics of the boiler or furnace which permit it to respond quickly to changes in weather and shut off the heat supply promptly.

Evidence so far available seems to indicate that the pres-

ence of a linoleum covering or carpeting, on the floor slab, does not materially change the heat-emitting character of the floor surface.

With panel systems properly installed in accordance with directions of pipe manufacturers, little difficulty has been caused by cracking of plaster walls or of concrete floor slabs. Shrinkage of wood flooring due to the heat source below it does not seem to be noticeably different from normal cases.

In considering the whole problem of panel heating and its possible advantages over the more conventional methods, it is well to remember that a standard steam, hot-water, or warm-air type of heating system supplies a great deal of its heat by a "panel effect." For example, in a forced hot-water radiator system in which small ½-in. and ¾-in. pipes led to radiators, and the water temperatures were relatively low, less than half of the heat required to heat the rooms in the Research Home at the University of Illinois Engineering Experiment Station was supplied by the radiators, and *over 50% of the heat supplied to the house was provided by the warm floors and warm walls* heated by the boiler, the pipes, and the chimney. If different at all, the percentage of heat so transmitted to the house will be larger with steam and warm-air systems because of their larger pipes or higher pipe temperatures, or both. In sum, conventional heating systems provide panel heat to the extent of 50% or more, and hence the change in room conditions to be looked for by installing a panel system will be much less than the average person would expect or the heating-plant salesman would admit in his discussion of the desirability of a change-over to the new type of heating. Thus, it is not at all surprising, as evidence accumulates, that both the design and performance characteristics of panel systems should show the same general character and trends as those for conventional systems.

Trends in Development

Progress in the development of panel heating will be hindered until it is recognized that *this system is merely another application of well-known principles of home-heating.* Frankly, many heating contractors have been scared away from panel heat by the news that the panel system is entirely different and involves very complex considerations in design and installation.

It must be remembered that a heating plant is only as good as the house in which it is installed. In a panel system the house is literally designed around the heating plant. Heat losses have to be minimized and construction has to be good. With this emphasis on good house construction and insulation, any kind of heating system would give better results, and in many cases the improved performance would be unjustifiably credited to the panel system.

For several years, the heating industry has recognized that low-intensity and large heat-emission sources are more desirable than concentrated sources. Hence, in steam radiators the trend is away from tall, thick radiators towards low wall-type radiators. In forced-circulation hot-water systems the development of baseboard radiators has been a logical step. These are usually hollow cast-metal panels about 7 inches high by 1¾ inches thick, connected to the heating boiler and heated to temperatures of 80° to 140°F. In forced-circulation warm-air systems the use of two registers in the living room, the use of slot-type registers near outside walls, and the trend toward practically continuous, low volume air circulation using high sidewall registers has been very marked in recent years.

Cost of Installation

While it is not possible at present to give definite figures on costs, in general the panel systems cost more than conventional systems, since standardization of practice has not been attained. Cost figures are variable depending upon whether the additional cost of providing structural features of the plant is included as part of the heating system cost. Many heating contractors have been applying a factor of safety in their costs in order to take care of unforseen contingencies, but it may, of course, be expected that this extra allowance will be reduced as experience is gained.

Requirements for a Good Panel System

Among the most important considerations in design of panel systems is the question of safe working temperatures for the heating surfaces. For the present, good practice seems to have evolved *maximum* safe surface temperatures for heating panels, given at top of page 14.

The value assumed for floor-surface temperature has been about 85°F in practice (the 90° figure given in the table being an allowable upper limit).

Extremely close cooperation between builder, architect, and heating contractor is required,

Type of Panel	*Surface Temperature Degrees F*
Plastered ceiling (pipe embedded)	**115**
Plastered walls (pipe embedded)	**120**
Floor, any method	**90**
Floor—border and aisles	**120**

and all plans for heating should be made in the blue-print stage. The system requires careful designing, since alterations are not easy to make. It is important to consider future possible additions to living space, so that provisions will be made for attaching later piping connections if one or more rooms are to be added or enlarged. Design procedure at present is a bit complicated, probably unduly so, since attempts have been made by some engineers to account for the "radiant effect." It is probable that as time goes on, the design will approach that of conventional systems in which the room heat loss is balanced by the heat input without fussing over the relative amounts of radiation and convection effects.

The home owner and builder should realize that to a certain extent the structural requirements of the building are governed by the heating plant. For example, if the house is tightly constructed and well insulated, floor panels alone may be sufficient to supply the required heat. If the structure is not wind resistant and the heat loss from a room is excessive, it may be necessary to have both floor and ceiling panels in that room. The few notably unsuccessful jobs that have been installed have been due to a disregard of these relationships by a builder who arbitrarily decided to use a given piping arrangement in a concrete floor irrespective of the heat loss from the room. In such cases, either the room was underheated, or the floor temperatures had to be raised higher than 90 degrees; the necessary excessive warming of the floor resulted in a very unpleasant effect on the feet of the occupants.

★ ★ ★ ★

Elite Boiler Water Treatment

SOMEONE is always turning up with a new product using trisodium phosphate as a major ingredient. This common chemical because of its cheapness and universal application in chemical specialties might almost be said to be the "Old Reliable" in the field of cleansing, water softening, and grease-removing substances.

Elite Boiler Cleaner is a boiler cleaning compound that claims to stop fuel waste "by removing sludge, oil and grease. Prevents foaming, priming or surging." Analysis shows the product to be about three-quarters trisodium phosphate and about one-quarter soda ash (sodium carbonate) with a small amount of brown dye.

At wholesale prices, the ingredients of the product without its container would be worth about 16c, whereas the actual selling price for 3 lb. is 8½ times as great, or $1.35. More important still, boiler feed water can no more be treated without knowledge of the particular problem presented by the actual water supply than a human ailment can be treated without expert diagnosis. The nature and amount of impurities in the water must be known, at least approximately, and the boiler compound correctly adapted to the scale forming compounds in the water. Not only that—the compound must be used in the right amounts and concentration to suit the water analysis. The American Society of Heating and Ventilating Engineers, for example, disposes of the "shotgun" method of treating boiler water by stating that "the use of soda, or any alkali, vinegar or any acid is not recommended for cleaning heating boilers because of the difficulty of complete removal and the possibility of subsequent injury, after the cleaning process has been completed."

This is sound advice. Sometimes an alkaline boiler compound can do good and sometimes it will be of little use. In any case, the elements of uncertainty are too great to warrant the purchase of a boiler compound except after knowledge of the exact situation, particularly the hardness and the nature of the hardness-forming materials in the water that is to be dealt with.

★ ★ ★ Men's Suits ★ ★ ★

MEN'S CLOTHING shows sufficient stability in design that the purchase of a suit should, by most people, be considered carefully from the standpoint of durability as well as of fashion; it is very likely that with most users the style of a business suit will be good for the wear-life of the suit purchased.

From time to time efforts are made to bring about somewhat drastic changes in men's fashions, but these have not met with any marked success. Some six years ago, for example, it was suggested that since the newly introduced collarless coat was proving fairly successful, men would welcome this revolutionary change from a coat style which had persisted for generations. Nevertheless the streets are not as yet crowded with men wearing collarless coats, or any approximation to them. Experience has shown that even marked improvements in comfort are not sufficient to change styles. Although there was much talk some time ago about men becoming emancipated sufficiently to go coatless on hot summer days, the idea was never widely accepted, in the Eastern states, at least, except in rural areas and small towns, where casual dress is the rule.

It is generally agreed in the trade that returning servicemen will tend to prefer a type of clothing much like what they wore before they donned a uniform, but that they *will* demand a degree of comfort. Manufacturers and designers expect to make concessions to the desire for more comfortable clothing by making jackets full across the back and loose at the waist and by making other clothing with details designed for maximum comfort and freedom of movement.

Fabrics

Although cotton and rayon fabrics have been developed for summer suitings, wool, because of its property of maintaining its press and good appearance better than other fibers, will undoubtedly remain the most popular fabric for all-year-round and fall-and-winter clothing. Wool suitings can be classified into two general classes: woolens and worsted.

Woolens are made by carding the cleansed wool and then spinning the yarns. Carding is done by large cylinders with wire teeth, these cylinders being revolved in opposite directions. The yarn is then drawn out and spun. The fibers used for making woolens are relatively short—usually two inches or less in length—because short-fibered yarns will fuzz or nap better than yarn made with longer fibers, and the woolens are essentially fuzzy or nappy fabrics.

Worsted yarns are carded, then combed. In combing, the large, wire-toothed revolving cylinders revolve in the same direction, in contrast with the method used for carding in which the cylinders revolve in opposite directions. The yarns are then spun, but with a twist that is tighter than that used for woolen yarns. The fibers used for worsted are relatively long, usually varying from two to eight inches in length.

Worsted yarns are stronger than woolen yarns and the worsted fabrics are usually more firmly woven, and smooth of finish, with little nap apparent. Generally speaking, worsteds wear well and hold their press and shape well. Heavily built men or men who are very hard on their clothes will probably find that worsted fabrics will give them better service than woolens. Worsted fabrics do, however, have a tendency to develop a shiny appearance. So-called "unfinished worsteds" are worsteds with the nap brushed up.

Wool Fibers

The quality and durability of both woolen and worsted fabrics depend upon the *quality of the wool fiber used*, and *upon the weave*. Virgin wools are superior to reprocessed or reused wools. According to the Wool Products Labeling Act, fabrics sold in interstate commerce that contain wool must be labeled as to all fibers present, each being stated as a percentage of the total fiber weight. (The percentage of fabrics used for ornamentation need not be specifically stated when the amount of these fibers does not exceed 5%.) The percentages of both reprocessed and reused wool that are present must be stated. *Reprocessed* wool is wool that has been previously woven or felted but never used by the ultimate consumer. *Reused* wool is wool that has been reclaimed from products previously used by the consumer. The consumer should look for the labeling showing wool type and content when purchasing a suit.

Since it is difficult to see the weave in a woolen fabric because of the fuzzy surface of the nap, reused wool is more commonly used in making woolens than in making worsteds.

Weave

While the consumer should give much weight to the fiber used, he must not by any means disregard the weave of the fabric. To be durable, a fabric should be closely woven and have a high and well-balanced thread count. Such a fabric will be firmer and warmer, and will keep shape better than a loosely woven, low-thread count fabric.

Much of the beauty of worsteds is in the pattern, which can be easily seen because the fabric is unnapped. Worsted yarns woven in a twill weave or a variation of it, make an attractive suit material, although a plain weave is sometimes used (as for example in the "tropical worsteds").

Fabrics woven in both warp and filling direction with two-ply yarns (that is yarns made of two threads twisted together) are likely to be more durable than fabrics woven with single-ply yarns.

Weight of Fabrics

Suiting fabrics differ widely in weight, and heavy fabrics are of course more likely to wear well than light ones. In the present tests the heavier fabrics were found in the *Sears* and *Bond* suits. The *Curlee*, *Stein*, and *Hart, Schaffner and Marx* fabrics were slightly lighter than the *Sears* and *Bond*. The *Clipper Craft* and *Hilton Stylebilt* were still lighter while the *Richman* fabric was a square-woven lightweight woolen of a type that is popular for summer wear.

Look at these points when buying.

The collar should not bunch or spread. Lapels should be carefully and evenly formed.. Fabric on the pocket flaps should be placed so that the design properly fits in with that in the adjacent portions of the coat. Buttonholes should be free from ragged edges, loose threads, and loops.

Tailoring

The best fabrics of suitable weight can be made into an unsatisfactory garment. Good fit and tailoring are necessary if a suit is to be a good buy. Sewing should be carefully done, linings should be well fitted, seams should be smooth, and buttons firmly secured. Buttonholes should be well made and free from ragged edges and loose threads and loops. Poorly tailored garments are likely to pucker at the shoulder seams and elsewhere. Other points to observe in tailoring are the lapels, which should be carefully, smoothly, and evenly formed, and the pocket flaps and edging, where the material should be so placed that the pattern properly matches that of adjacent parts of the fabric of the coat and vest.

Well-made coats have the padding over the shoulder blades protected by a double lining which also serves to hold the padding in place. The padding itself, to be of the most satisfactory type, should be of cotton. Some padding is made of *Kimpak*, a paper product like *Kleenex*, and four of the suits tested had pads made in part of this material. This may be one of the results of supply difficulties of the war period; certainly it is to be hoped that all post-war suits to be made after a few months' transition period will have pads made of cotton materials.

Fit is a matter to be judged by the individual purchaser, who will do well to keep in mind that when any alterations required are of a difficult nature, or expensive, the seller is not likely to call attention to the need for them. Probably the most common faults of fit are spreading or bunching collars, and incorrect sleeve lengths. The bunching collar is especially troublesome. Better tailors will alter the collar to correct the fault, but a sim-

pler method (and a less satisfactory one) is to sew a pad under the collar to restore the fullness.

CR's Tests

In CR's tests, eight well-known brands of suits were purchased by individuals in the usual way. A portion of the fabric of each suit was then cut up and subjected to tests for breaking strength, resistance to abrasion, ply of yarn, thread count, weight of fabric, and colorfastness to light when exposed for 40 hours in a Fadeometer (an appliance used for determining the lightfastness of fabric dyes under standard accelerated conditions with strong ultraviolet light). The fabric was also examined for fiber content.

Fit and quality of workmanship were judged, and suits were opened at the seams to judge the quality of the interlinings, padding, and other parts which could then be observed.

The fit of the suits was considered satisfactory by the purchasers except in the case of the *Sears* suit which had sleeves that were an inch shorter than ordered. In spite of the general satisfaction expressed by the wearers, there were some slight lapses from a good fit. The points of most trouble were sleeve length, and wrinkles under the collar, four cases of each being found. Close fit of collar, waist of trousers, and seat of trousers were each faults that occurred in two cases, while one vest was tight, and one sleeve was too tight.

Fabrics of all suits tested were 100% wool, except in some cases where viscose or acetate rayon was used (in very small amounts) for ornamentation.

Ratings are by Consumers' Research and are cr45.

A. Recommended

Sears, Doubleton De Luxe Fashion Tailored, Cat. No. 55—7174 (Distributed by Sears, Roebuck & Co.) $27.95, plus postage. Gray flannel type, soft finish suiting, twill weave, with blue and gray stripes. Two-ply warp and single-ply filling. Weight of fabric, 9.3 oz. per sq. yd. (one of the two heaviest fabrics of the suits tested). Thread count, 66 x 66. Breaking strength: warp, 70 lb.; filling, 47 lb. Resistance to abrasion, very good—best in test. Showed no significant fading but color showed slight change in tint in Fadeometer test. Tailoring and general construction, judged good. Fit satisfactory as received except that the sleeve length was one inch less than ordered. **1**

Stein's, Cloth No. C 10288 (Stein's, 149 Fifth Ave., New York 10) $22.50. Fabric, gray flannel type, soft finish suiting, twill weave, with a white stripe. Two-ply warp, single-ply filling. Weight of fabric, 8.8 oz. per sq. yd. Thread count, 68 x 66. Breaking strength: warp, 67 lb.; filling, 45 lb. Resistance to abrasion, about average. Showed very slight fading in Fadeometer test. Tailoring and general construction, judged good. **1**

Bond, Executive Group, Lot 50201 (Bond Clothing Stores, New York City) $40.75. Fabric, dark gray unfinished worsted, alternate twill weave, with faint blue and white rayon stripes. Single-ply warp and two-ply filling. Weight of fabric, 9.3 oz. per sq. yd. Thread count, 60 x 56. Breaking strength: warp, 59 lb.; filling, 47 lb. (best balanced of the fabrics tested). Resistance to abrasion, good. Showed no noticeable fading in Fadeometer light-fading test. Tailoring and general construction, judged good. **2**

B. Intermediate

Richman, Lot 55547, Cloth No. 5461 (Richman Bros. Co., Cleveland) $24.50. Fabric, medium brown, worsted suiting, plain, or square weave. Two-ply warp and filling. Weight of fabric, 6.8 oz. per sq. yd. Thread count, 52 x 50. Breaking strength: warp, 46 lb.; filling, 35 lb. (adequate strength for a lightweight fabric); fairly well balanced. Resistance to abrasion, poor, relative to other suits in group but satisfactory, considering light weight of fabric, which was a square weave. Showed appreciable fading in test. Tailoring and general construction, judged good. **1**

Curlee, Cloth No. 4102 (Curlee Clothing Co., St. Louis) $40. Fabric, dark blue unfinished worsted serge, twill weave. Two-ply warp, single-ply filling. Weight of fabric, 8.9 oz. per sq. yd. Thread count, 69 x 63. Breaking strength: warp, 62 lb.; filling, 45 lb. Resistance to abrasion, about average. Showed no noticeable fading in test. Tailoring and general construction, judged fair (more machine work than considered desirable). **2**

Hart, Schaffner & Marx, Belmont DB, No. 53 (Hart, Schaffner & Marx, Chicago) $50. Fabric, brown herringbone worsted suiting, alternate twill weave, with rayon stripes. Two-ply warp and single-ply filling. Weight of fabric, 9 oz. per sq. yd. Thread count, 69 x 63. Breaking strength: warp, 63 lb.; filling, 44 lb. Resistance to abrasion, good. Showed appreciable fading in test. Tailoring and general construction, judged good. **3**

* * *

The following suit is somewhat less satisfactory in certain respects, than other suits in this *B* group.

Clipper Craft, Dudley Short, Cloth No. 7058 (Trimount Clothing Co., N.Y.C.) $35. Fabric, brown worsted, twill weave, with reddish brown rayon stripe. Two-ply warp and single-ply filling. Weight of fabric, 8.5 oz. per sq. yd. Thread count, 68 x 60. Breaking strength: warp, 68 lb.; filling, 37 lb. (considerably out of balance). Resistance to abrasion, average. Showed no noticeable fading in test. Tailoring and general construction, judged fair (more machine work than considered desirable). **2**

C. Not Recommended

Hilton Stylebilt, No. 432396 (Style-Bilt Hilton Clothes Co., Chicago) $45. Fabric, hard-finished medium blue serge, twill weave. Single-ply warp and filling. Weight of fabric, 7.5 oz. per sq. yd. Thread count, 100 x 58. Breaking strength: warp, 62 lb.; filling, 32 lb. (considerably out of balance). Resistance to abrasion, below average. Showed appreciable fading in test. Tailoring and general construction, judged poor. The buttonholes of the suit tested were poorly made. **3**

Traces of Things In Relation To Life and Health—II

Conclusion of the October article discussing the elements which are vital in fertilizer, feeds and foods, and in water — though needed only in minute amounts.

To take advantage of the life-insurance statistics which indicate that an underweight adult outlives an overweight, the natural carbohydrates (raisins, dates, honey, potatoes, etc.) should be carefully controlled as to amount for adults. (Children probably require more carbohydrate than adults.) A restriction in the intake of foods containing sugar and starch is a distinct advantage so far as intake of vitamins and minerals (including trace elements) is concerned, since sugar and starch are noted for their lack of everything except energy, and are thus lacking in the more subtle food substances, including perhaps an appreciable number not yet isolated and studied by nutrition scientists. All highly refined foods, those which have been produced by removal of "impurities," e.g., those made from sugar and white flour, or those to which unnatural substances have been added should be reduced to an absolute minimum in the diet. Sugar, especially, has a "double-barreled" effect in contributing to a reduced intake of vitamins and minerals since it contains none and, by satisfying hunger rapidly, reduces the amount eaten of foods containing these all-important traces.

It is unfortunate that most food-manufacturing processes, particularly those of the factory and of large-scale industry, have, with one notable exception, tended to remove or unbalance vitamins and minerals to a serious extent. (The exception is quick freezing.) These food-treating processes have been aimed, for the most part, at stabilization of the food against spoilage and have, so far as the consumer is concerned, resulted in production of commercial foodstuffs that are not safe to be included in the diet except in limited amounts. (Frozen foods again must apparently be excepted.)

The common impression that foods that spoil easily or rapidly are not so healthful as foods that keep well and resist spoilage is incorrect. The reverse, indeed, is almost true as a safe generalization. If molds and bacteria cannot live on a food, there is a good chance that the human consumer should not try to.

It is obviously foolish to supplement a poor diet with "minerals" from the drugstore because one may already be getting an excess of some. It doesn't take much of an excess of fluorine or cobalt to get one into serious trouble as has already been noted in this discussion. Other trace elements may later be found as critical as these two. Further, any drugstore supplement is almost certain to throw one's food intake more seriously out of balance because of the trace elements the supplement lacks. The mineral elements now known to be most often deficient in human diets are: Calcium, iodine, iron, and possibly zinc. Future research will doubtless uncover other deficiencies. The elements most frequently present in excess, sometimes to a dangerous extent, are lead, arsenic, fluorine, and selenium. It is possible, *by selection of the correct natural foods* (not by purchase of pills and tablets at the drugstore), to correct all of these deficiencies or excesses.

There is the growing impression in some circles that diet alone can cure or prevent most disease. From sound scientific facts known at present, this position does not seem justified. A goodly number of diseases, such as scurvy, several kinds of anemia, and tuberculosis, are certainly caused or predisposed by poor diet. Other diseases are markedly affected by diet but are neither caused nor cured by diet alone, except in so far as diets containing insufficient protein may have contributed toward reducing the body's resistance to infection. (About this latter point, much is being learned, but it is unlikely that any degree of improvement or resistance to infection could render man immune to such diseases as rabies, smallpox, or yellow fever, if circumstances had exposed him to a direct contact with an infected source.)

Traces of things which come into contact with the body in ways other than through food

may have profound effects. Why is it that athletes almost invariably make better records outdoors than in? Is it the larger amount of ozone and gaseous ions in the outdoor air that makes the difference? (There is more than a little reason to suppose that there are vital differences between the air indoors and outdoors that have not been explained by scientific investigators.) Future research will answer these questions and may possibly provide, in addition, ways of making indoor air just as healthful, fresh, and stimulating as outdoor; this would be air-conditioning worthy of the name. In our smoky cities, it is a real advantage to live on the windward side so as to avoid much of the soot, known to have a cancer-producing effect, and irritating sulfur dioxide. There is an even greater advantage in living out in the country where the air is still purer. With the possible exception of moderate amounts of dusts that contain lime, there are none which it is safe to breathe, and many, such as those containing finely divided lead, quartz, or asbestos, or mercury vapor, are highly dangerous; these are traces of things to be avoided with the greatest care.

One often wonders about the effect of traces of things in drinking water. Much of the water for home use in this country is obtained from lakes, streams, and rivers polluted with sewage and trade wastes. While the purification processes remove most of this pollution, they do not remove all, as is evidenced by too frequent appearance of bacteria, color, and foul tastes and odors in the tap water of many cities. There is the further point that in the process of treating waters to purify them, new substances of potentially toxic character are added, and some of these may be definitely dangerous to health when consumed over a period of many years. Water supply experts in their endeavors to produce clear and "appetizing" drinking water have given far too little attention to problems of this character. In the meantime, the consumer who must at times consume water from an especially bad supply, can remove traces of color, tastes, odor, and some of the bacteria by mixing the offensive tap water with powdered charcoal—about ¼ teaspoon to the quart is right—and filtering. The charcoal and filtering equipment can be obtained from the drugstore. It is a pleasant surprise to find out how much better-tasting the treated water is. It should be noted that this treatment will not remove the brackishness due to salts nor enough bacteria to make the water bacteriologically harmless if it was not previously so. Whether the precipitation and removal of essential elements, such as calcium, magnesium, iron, zinc, manganese, cobalt, and copper, from drinking water by present treatments has any significance for the health of the communities using treated water should be settled by thorough research. Probably a great deal depends upon the characteristics of the water supply in particular communities, and the treatment processes used by the water works authorities therein.

Automobile Radiator Cleaners

SINCE the war, there seems to have been an epidemic of difficulties with radiators; one form of radiator trouble has been serious overheating on hot summer days. The special motoring conditions of wartime, no doubt played a part, with speed of driving and mileage far below normal for most cars. On this account the rapidity of water flow through the radiator has often been abnormally low, with a greater tendency for sediment and other particles to lodge on tubes and in other interstices in the radiator. Wartime cooling difficulties at any rate have created a strong interest in commercial radiator cleaning compounds, described as rust removers, cooling-system conditioners, cooling-system cleaning compounds, and radiator flushes. These products differ widely in composition and in principle. Some are sold as powders, some as liquids. Some contain one or two ingredients, others perhaps half a dozen.

Alkaline Cleaners. Many of the well-known cleaners are

based on a composition of one or more alkaline salts, sold both as a powdered mixture and in solution. An example of a very strongly alkaline product is one containing over 60 percent of caustic soda, over 20 percent of trisodium phosphate and a smaller amount of soda ash (like washing soda). Such a composition dissolved in the cooling water of a car would be extremely alkaline and would attack brass connecting parts and aluminum. (The cylinder heads are often made of aluminum alloy.)

Alkalis are used in these products because the film of corrosion to be removed is always somewhat oily and greasy. The alkali reacts with fatty acids in the grease to form soap, which being in such intimate contact with the grease is very effective in emulsifying it so that it can be flushed out as an emulsion, as soapy water flushes away greasy dirt from grimy overalls. The greasy layer is imbedded in the scale of iron rust which forms on the iron or steel portion of the radiator. Iron rust is very flaky and easily scales off the surface on which it is formed. With removal of the oil and grease coatings and matrix material from the layers of iron rust, these layers tend to become loosened and the rust particles dispersed so that they can be removed as small suspended particles by draining out the water in the radiator and flushing with clear water afterwards.

Most of the alkaline-reacting products do not contain caustic soda as such, as this is a rather dangerous chemical to handle. Such a solution is very corrosive if spilled or splashed on the hands, and might seriously damage the finish of the car if spilled on that. As already noted, it would definitely and rapidly attack aluminum parts. Much more common alkaline substances are trisodium phosphate and soda ash, both alkaline salts with a rather high degree of alkalinity but far less than that of caustic soda (sodium hydroxide). These perform their function in the manner just described by their manner of reaction in solution in attacking and emulsifying oily or greasy material.

Silicate Cleaners. Another alkaline salt which may be used alone or in combination is sodium silicate. This is sold in various forms which vary from a fairly marked degree of alkalinity to a very strong degree of alkalinity.

Sodium silicate has some advantage over the other alkaline salts that have been mentioned in that it is colloidal (like a water soluble gelatin or gum); this property enables it to act very effectively to hold solid particles of iron rust in suspension so that they can be flushed out with the water in the radiator. Its alkalinity causes it to react with greases in the same way trisodium phosphate does.

Many of the silicates are not definite chemical compounds and these are described chemically in terms of the ratio of sodium oxide, Na_2O, to silica, SiO_2, in the form, $Na_2O:SiO_2$; the higher the proportion of sodium oxide, the more alkaline and the less colloidal the product becomes; the higher the proportion of silica, the less alkaline and the more colloidal it becomes. Sodium metasilicate is an example of a definite chemical compound of sodium silicate and oxygen, and has the formula Na_2SiO_3, which expressed in the above form has the ratio $Na_2O:SiO_2$ of 1:1.

Examples of commercial forms of silicates[1] used in radiator cleaners are:

Brand designation[1]	*Form*	*Ratio $Na_2O:SiO_2$*
Metso granular	**granular**	**1:1.0**
B W	**liquid**	**1:1.6**
C	**liquid**	**1:2.0**
U	**liquid**	**1:2.4**

Many of the commercial cleaners combine one of these silicates with varying proportions of trisodium phosphate and soda ash in solution. Some combine *Metso* with other salts in a granular or powdered form, and at least two consist simply of a 40 percent aqueous solution of still another grade of silicate, $Na_2O:SiO_2$, 1:1.74.

The choice of the proper grade of silicate is important. One that is too alkaline will attack brass and aluminum, for example, *Metso* with its $Na_2O:SiO_2$ ratio of 1:1; one that is too siliceous will tend to deposit a film which will make for poor heat transfer and cause overheating, for example, *U* Brand with $Na_2O:SiO_2$ of 1:2.4. Too much of this latter type might form enough deposit to clog up the thin radiator tubes. In practice, silicates are often combined with other alkaline salts; this is probably done to reduce the alkalinity, as the other salts would tend to "buffer" the solution at a lower degree of alkalinity or lower pH than would be given by the silicate alone.

The customary means of expressing alkalinity of a solution quantitatively is in terms

[1]These brands are sold by the Philadelphia Quartz Company, 121 S. Third St., Philadelphia. These do not correspond to the type of silicate sold in hardware, drug, and general stores, and used for preserving eggs. The silicate used with eggs is the *E* Brand, having an $Na_2O:SiO_2$ ratio of 1:3.22; it could be used in place of another brand if combined with soda ash or trisodium phosphate to increase its alkalinity.

of pH, a nearly neutral substance like freshly distilled water having a pH of 6, while more alkaline substances run up the scale from 7 to 14 (7 corresponding to theoretical and exact neutrality). The higher the pH value, the more alkaline the material.

The pH of solutions of some of the materials discussed is shown in the table, in decreasing order of alkalinity.

Soap is included to show the value in terms of pH of a familiar, moderately alkaline solution. A pH of 11 or more is sufficiently caustic that it would weaken cotton fabric (which, among common organic substances, is a material rather exceptionally resistant to the action of alkalis) if left in prolonged contact with it, for example, for several hours. The lower alkalinity of a solution of soda ash, pH 10.65, is sufficient to cause corrosion of aluminum if left in contact with it for more than a few minutes. Silicates are less corrosive to aluminum than other alkaline salts either at the same alkalinity or at a somewhat higher alkalinity. The siliceous element in the compound seems to afford some protection against attack.

In some experimental work that was done on this question, the *C* brand of silicate, Na_2O:SiO_2, 1:2, was used experimentally as a radiator cleaner; this appeared to give very satisfactory results. The method was to add 2 ounces to the radiator filled with water and then to run the motor very hot so that it heated the water nearly to boiling. The hot water was allowed to circulate for 10 to 15 minutes, after which the solution was drained off and the radiator flushed out with clean water.

Reaction of Alkaline Agents in Solution

Agent	*pH*	*Conc.*
Caustic soda	**11.9**	**0.1%**
Silicate Na_2O:SiO_2, 2:1	**11.8**	**0.1%**
Silicate Na_2O:SiO_2, 1.5:1	**11.6**	**0.1%**
Silicate Na_2O:SiO_2, 1:1	**11.3**	**0.1%**
Trisodium phosphate	**10.8**	**0.033%**
Silicate Na_2O:SiO_2, 1:1.6	**10.7**	**0.033%**
Soda ash	**10.65**	**0.033%**
Soap	**10.2**	**0.1%**
Silicate Na_2O:SiO_2, 1:3.86	**10.1**	**0.033%**

If a mixture of powdered or crystalline material is used, such as one of alkaline salts, the amount to be added to the radiator water *should be dissolved in water first*, and this solution poured into the nearly filled radiator (with care, of course, to avoid spilling the material on any part of the finish of the car). This predissolving of the alkali is to make sure that its particles are actually in solution, and so cannot contribute to clogging of the system.

Use of Rust Inhibitors

A number of commercial products incorporate a small amount of an agent to prevent attack on metal by the strong alkalies present. The compound used for this is sodium or potassium chromate.[2] The chromate is effective when used in only a small proportion, such as 1 to 3 parts of chromate to a thousand parts of water. This material is ordinarily used in ready dissolved form as a liquid with a strong yellow color. It is believed to act by forming a very thin film of metallic oxide which serves as a protective layer to prevent further attack on the metal beneath. The outstanding chemical property of the chromate is its functioning as an oxidizing agent.

Use of Solvent

Some radiator cleaners are sold as two products, one a can of liquid, the other a package of powder. The liquid is apt to be a mixture of oil or kerosene and *ortho*-dichlorobenzene, used to dissolve grease and so wash it out, while the powder used afterward is an alkaline salt such as soda ash, to emulsify the greasy mixture and render it easy to wash away. Some manufacturers combine the two types of materials in a single form, as an emulsion of kerosene, the grease-solvent, with a solution of silicate, for example, as the alkaline substance to wash away the dissolved grease. A cheap grade of soap is the usual agent used to keep the two substances in emulsified form, ready for use.

Acid Cleaners

Acid radiator cleaners are

[2] Either of these can be purchased at any chemical supply house.

Dissolving Action of 100 ml. (about 3-1/3 fluid ounces) of Solution on Calcium Carbonate in 15 minutes at 180° F

Compound	*Type*	*Concentration in %*	*pH at room temperature*	*Grams of Calcium Carbonate Dissolved*
1. Oxalic acid	Acidic	3	1.10	0.4-0.5
2. Sodium bisulfate	Acidic	3	1.18	0.4-0.5
3. Trisodium phosphate	Alkaline	1	11.9	0.3
4. Sodium carbonate	Alkaline	1	11.1	0.1
5. Metso-sodium silicate	Alkaline	1	12.2	0.1
6. Tetrasodium pyrophosphate	Alkaline	1	10.1	less than 0.1
7. Sodium hexametaphosphate (Calgon)	Neutral	1	6.65	0.1

much less common than the alkaline cleaners, probably because there is some danger of attack on iron by the acid, at the same time the material is attacking the iron rust. If cars have been used for a long time without cleaning out the radiator, a deposit of mineral salts will accumulate. These are the hardness-forming materials deposited from the water. Even soft water will produce this deposit because it too contains a small proportion of calcium and magnesium salts. (These give the taste to water, in contrast to the flat taste of boiled water from which "temporary" hardness has been removed.)

Evaporation of relatively large amounts of soft water, or smaller amounts of hard water, therefore leaves a crust of material on the inside of the radiator. This contains, besides the rust on iron parts, calcium carbonate, calcium sulfate, and magnesium oxide.

The advantage of an acid agent for cleaning is that it will dissolve at least some of this layer of mineral salts. Acids, if strong enough, also dissolve iron rust. At the same time there is danger of attack on clean iron. To overcome this a compound similar to that used in alkaline solution to inhibit corrosion, is also used here. This is sodium or potassium dichromate.

The materials used to give an acid reaction vary from one of a fairly mildly-reacting acid such as citric acid, to stronger agents such as sodium acid sulfate and oxalic acid.

A government specification (TAC, ES No. 734b, issued September 24, 1943) calls for an acid cleaner to be followed by a neutralizing solution. This specification calls for a powdered substance to be used by dissolving 1 part of the powder in 33 parts water to give a 3% aqueous solution at 180°F to 190°F, and states that the active ingredient shall be oxalic acid, a bisulfate, or a combination of the two. The pH of the solution is specified as 1.4 to 1.7, which is strongly acid, only slightly less so than 0.1 normal hydrochloric acid which has a pH of about 1. (The lower the numerical value of pH for an acid solution, the greater the degree of acidity.)

The neutralizer specified is an alkaline salt giving a mild degree of alkalinity in 0.3 percent solution.

This method of cleaning requires two products and three operations. First, the acid cleaning solution is used and drained off; second, the alkaline solution is used to neutralize residual acid and this is drained off; third, flushing with water is used to remove the residue of neutralizing agent, and this is then drained off, the radiator then being filled with clean, fresh water.

Laboratory Results. In order to study what effect the various types of compounds used in radiator cleaners would have on accumulated scale, the dissolving action of compounds of each type was determined, using calcium carbonate as representative of the radiator deposit insoluble in plain water. Since pure chemicals were used, while in the commercial compounds fillers are permissible, the pH values of the test samples fall outside the specification. That means that the efficiency obtainable with the compound made according to the specification could be expected to be somewhat lower than was found in the laboratory tests using the pure materials. The results of the study made for CR are shown in the table at the head of this page.

The pH of the solutions was determined at the concentrations indicated; the first two, having quite low pH values, were strongly acidic, the next three strongly alkaline, and the seventh, with the pH value not far from 7, was neutral. The maximum amount of calcium carbonate which would dissolve in 100 ml. of each solution heated to 180°F was determined roughly as shown in the last column.

The results indicate that for efficient removal of a heavy deposit of scale, *an acidic cleaner should be used*, which may be either oxalic acid or sodium bisulfate. These results indicate that the government specification mentioned calls for a product of an efficient type. Both the acid substances mentioned are solids in powder form and before use are dissolved in water and then poured into the radiator. The following is a practical way of using these scale removers:

Dissolve 1 pound of either oxalic acid or sodium bisulfate in 1 gallon of water. Add 1 pint of this solution to a nearly filled radiator and let the liquid circulate hot for about 10 minutes. The two agents should be about equally effective, since it is the acidity which is of value. The other properties of the compound do not give it any effect on radiator scale. When iron rust is the important factor in the clogging, oxalic acid will be the more effective material, as it is especially active against rust. If the sodium bisulfate is used, the effectiveness of the solution against rust can be improved by adding a level teaspoonful of table salt to a gallon of the original solution made by dissolving a pound of bisulfate in the gallon of water.

After an acid cleaner has been used the liquid should be drained off. A dilute solution of soda ash—sodium carbonate—or trisodium phosphate[3] should then be put into the radiator to neutralize residual acid. Dissolve 3 to 4 ounces of the alkaline salt in water and add to radiator chamber, already nearly full with clean water. Let this circulate for 10 minutes. Empty the radiator and then fill it with plain water to remove residual alkaline solution and again drain and refill.

The alkaline cleaners were not very effective under laboratory conditions in removing hard-water scale, as indicated in the table. (They would be more so in practice because of the presence of oily matter adherent to the deposit.) The last two products in the list, sodium pyrophosphate and sodium hexametaphosphate, were also tried at room temperature by contact of their solutions with calcium carbonate over a period of several hours, but were even less effective than the treatment with hot solutions. They are therefore not recommended for this purpose.

Conclusions. Both alkaline and acid radiator cleaners are effective for the normal cleaning of radiators. Their action is quite different in that the alkaline agents act on the grease present to cause emulsification of oil, and wetting and loosening of rust scales by the soap formed with fatty acids present in the grease. Strongly alkaline reagents should be combined with a sodium or potassium chromate corrosion inhibitor.

Acid cleaners act by a direct attack on iron rust and on scale deposited from hardness in the water. Their use is indicated where hardness deposits have accumulated sufficiently to reduce heat transfer and cause overheating of the engine on hot summer days. An acid cleaner should be followed by the use of alkaline neutralizing agents as prescribed in the Government Specification.

For general use, and when the clogging difficulty is not extreme, a not too strongly alkaline cleaner should do the job well enough and with minimum risk of damage to the radiator. An ounce or two of a single alkaline salt dissolved in water and poured into the filled radiator should do the trick. After a few minutes circulation of the solution made hot by running the engine, with air circulation through the radiator blocked off temporarily, if necessary, to accelerate the heating-up process, the solution is drawn off and the radiator filled with fresh water.

Radiator Cleaners Made of Silicates and Other Alkaline Materials

Commodore Radiator Flush (Commodore Products Co., New York City) A limpid yellow liquid, about 6% trisodium phosphate, 5% soda ash, 1% potassium dichromate, and 88% water.

Davco Flush Cleaner (Davis Laboratories, Inc., Newark, N. J.) A fine pink powder that was found to be about 8% trisodium phosphate, 70% sodium carbonate (washing soda or soda ash) and 22% water.

DuPont Radiator Cleaner (E. I. DuPont de Nemours & Co., Inc., Wilmington, Del.) A thin yellow liquid that consisted of about 22% trisodium phosphate, 4% sodium dichromate, and 12% sodium silicate solution ($Na_2O:SiO_2 = 1:2.4$, similar to Philadelphia Quartz Co. *U* Brand, and water—about 62%).

Empire Radiator Cleaner (U. S. Auto Supply Co., N. Y. C.) A colorless liquid found on analysis to be a solution of sodium silicate ($Na_2O:SiO_2 = 1:2.8$, similar to the *K* Brand of Philadelphia Quartz Co.).

Mobo Radiator Cleaner (John T. Stanley Co., Inc., N. Y. C.) According to an old analysis, this was a white powder consisting of about 60% soda ash (sodium carbonate) and 40% sodium metasilicate.

Motor Lux (Universal Chemists, Boston) A crumbly cream-colored powder, about 91% trisodium phosphate, 6% soda ash, 2% sodium metasilicate, with about 1% tallow soap.

Norust (Mogaco Laboratories Inc., Buffalo) This limpid yellow-colored transparent fluid, according to an old analysis, was a solution of sodium silicate colored with a yellow dye ($Na_2O:SiO_2 = 1:3.25$, similar to the *N* Brand of Philadelphia Quartz Co.).

[3] The well-known commercial products *Oakite, Climalene, Mel'o, Dif, Whisk, Soilax*, are entirely or chiefly trisodium phosphate.

Old Colony Radiator Flush (Tri-State Products Corp., N. Y. C.) A thin yellow liquid, found on analysis to be a solution containing about 16% sodium silicate ($Na_2O:SiO_2 = 1:2.33$) and 0.4% potassium chromate.

Purgo Radiator Cleaner (Liquid Veneer Corp., Buffalo) A thick greyish white liquid that was about 9% sodium sesquisilicate, 1% sodium aluminate (a water softening agent) and about 90% water.

Radiator Flush (General Motors Sales Corp., Detroit) A thin colorless liquid, found to be a solution of sodium silicate ($Na_2O:SiO_2 = 1:2.4$, similar to Philadelphia Quartz Co. *U* Brand). The strength of the solution was approximately that given by dissolving two parts sodium silicate in one part (by volume) of water.

Ward's Radiator Cleaner (Distributed by Montgomery Ward & Co.) A fine white grainy powder that was found on analysis to be about 89% trisodium phosphate, 10% sodium carbonate, and ½% each of sodium chloride (salt) and sodium silicate.

Whiz Radiator Flush (R. M. Hollingshead Corp.. Camden, N. J.) A limpid pale yellow liquid that was found on analysis to be about 33% sodium silicate ($Na_2O:SiO_2 = 1:2.4$, similar to Philadelphia Quartz Co. *U* Brand), about 0.15% potassium chromate (a rust inhibitor); the rest, about 67%, was water.

Cleaners of the Oil- and Grease-Solvent Type

Ameroid Radiator Cleanser (American Colloid Corp., N. Y. C.) Two containers supplied; in one was a red, oily liquid that on analysis was found to consist of about equal amounts by volume of *ortho*-dichlorobenzene and petroleum oil to which was added a small amount (about 4½%) of a fatty acid, probably a mixture of stearic and oleic acids. A small amount of red dye also present. The material in the second container was a white grainy powder, found to be sodium carbonate (washing soda or soda ash).

G M Cooling System Cleanser (General Motors Sales Corp.) Two packages. No. 1, a thin dark pink liquid that was found on analysis to be a mixture of *ortho*-dichlorobenzene and neutral coal-tar oil, in about equal amounts by volume, colored by a red dye. No. 2 was sodium carbonate.

Mobil Radiator Flush (Socony-Vacuum Oil Co., Inc., N. Y. C.) A thin white oily liquid that on analysis was found to be about 34% petroleum naphtha, 16% *ortho*-dichlorobenzene, 2½% trisodium phosphate, 6½% sulfonated oil (a soap substitute), and 41% water.

Acid Cleaners

Cadillac Cooling System Cleaner (General Motors Sales Corp.) A crystalline mixture (in appearance similar to brown sugar) that was found to be about 82% oxalic acid, 5% sodium bisulfate, 12% sodium sulfate, and 1% soft petrolatum.

Du Pont Automotive Cooling System Cleanser (E. I. DuPont de Nemours & Co., Inc.) A pink granular material, found to be almost 100% oxalic acid with a small amount of iron oxide and a white powder, which, when analyzed, was found to be sodium carbonate.

Eveready Cooling System Cleaning Compound (National Carbon Co., Inc., N. Y. C.) Two containers. In one was a tan-colored grainy powder that on analysis was found to be about 76% sodium bisulfate, 12% sodium sulfate, 5½% sodium phosphate, and 6% of soap bark and tannin extract. In the second container the material was found to be sodium carbonate.

Permatex Radiator Cleaner (The Permatex Co., Inc., Brooklyn, N. Y.) A thin yellow liquid that on analysis was found to be 18% hydrochloric acid, 1% each of copper sulfate and sodium sulfate, and about 80% water.

Sani-Flush (The Hygienic Products Co., Canton, Ohio) Small white globular pellets together with a small amount of powdery material. The product was found on analysis to be about 6% sodium sulfate, 80% sodium bisulfate, 11% sodium chloride, and about 3½% insoluble matter that was a flat laminar material similar to ground mica.

Ink, Made to Order and to Specifications

★★★★★ ★★★★★

In its August 1944 BULLETIN, Consumers' Research briefly mentioned in an article on Inks the availability of dry ingredients for a high-grade ink conforming to government specifications from the Warren County Drug Store, Washington, New Jersey. This store received orders from 26 States of the Union; a number even came from people who wished ink shipped abroad, including an American military organization in the Near East, and two military officers from Massachusetts and Missouri. Three women who appreciated the value of exceptional permanence in letters in wartime, asked that the ink ingredients be forwarded for use of relatives in foreign military service. Orders came from several colleges, a large automobile manufacturer, a hospital, and a religious organization.

The ink ingredients are furnished by the Warren County Drug Store, Washington, New Jersey, weighed and measured, ready to add to a quart of water (water should be added only when the ink is needed for use, and the bottle should be filled right up to the cork). The charge is 40 cents, which includes postage within the United States.

Off the Editor's Chest

(*Continued from page 2*)

Annual Cumulative Bulletin, the *Toastmaster* again received an *A. Recommended* rating, but the price had fallen to $10.

It is the fashion in certain circles these days to deride as outmoded the economic theory that competition makes for efficiency in business and that through its operation consumers are assured better products at prices that tend to be more and more favorable in the long run. It is the view of some official critics of business enterprise that competition is an outmoded method of regulation of industry, and that what we need in these more modern times is an absentee system of management conducted by administrators in Washington, D.C., who will tell manufacturers what they should make, when they should make it, and what price they will be permitted to charge for it. Certain governmental officials and labor leaders who advise government agencies on how the public business should be conducted have urged that the government should go into production in certain fields, on the assumption that under government operation products will be cheaper and better than those now being turned out by private industry.

Such an arrangement is, of course, ideal for governmental managers and administrators, who do not have or need to have any knowledge of the rigors of cost accounting and are not required to balance costs of labor and other factors against income, with the prospect of going out of business if income does not exceed outgo. From the professional labor leader's standpoint, of course, an arrangement for government operation of factories and stores is an ideal one. From the consumer's standpoint, however, it leaves much to be desired, as is well known to all who have had opportunities to examine various government housing and resettlement projects such as those at Hightstown, New Jersey, or Arthurdale, West Virginia, where financially the whole project was a failure and ultimately turned out not to be satisfactory even to those who were its beneficiaries as low-rent tenants of the buildings provided at public cost.

Those who know the stupendous tax costs that have been run up in scores of such ventures will be reluctant to see any more of them entered upon, for it often costs as much to "terminate" a government project as it does successfully to operate a non-governmental one; the process of termination often goes on for years, with employment of clerks, accountants, and officials by the score.

As for the OPA's efforts to "hold the line" and keep prices down, the process as worked out in many cases simply resulted in the disappearance of the needed articles —poultry and butter, for example —from the market. With textiles, the price-line-holding endeavors neither held down the prices of clothing nor prevented the quality from being deteriorated, and with many items, such as men's underwear and shirts, the net effect was to cause the disappearance of supplies from the market in the larger sizes and in the most desired styles.

Except under a dictatorship, there is no known method of making a manufacturer make or a dealer sell goods on which he loses money. No one but a dictator-minded individual would propose that manufacturers or anyone else *should* operate on a basis which causes loss. To do so, would be as unfair as it would be to require by governmental edict that workmen should work for wages below subsistence. Furthermore, the records show that by and large and in the long run, savings made in manufacturing and marketing costs are passed along to consumers in the form of better and lower-priced appliances. (For a surprisingly large percentage of business firms, as every head of a small and struggling industry knows only too well, profits are often not profits, but losses, and money to pay the help may often have to come from capital funds rather than current earnings.) It is true that savings do not reach the consumer as soon as he might reasonably want them to, in some cases, but by and large and given time, he usually does get the savings—as he does not, for example, get savings in his tax bill because governmental operation has become more efficient and less waste-

★ ★ ★ ★ ★ ★

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933, of Consumers' Research Bulletin published monthly at Washington, New Jersey, for September 1944-September 1945—State of New Jersey, County of Warren ss. Before me, a Notary Public in and for the State and county aforesaid, personally appeared F. J. Schlink, who, having been duly sworn according to law, deposes and says that he is the editor of the Consumers' Research Bulletin and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit: 1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Consumers' Research, Inc., Washington, New Jersey; Editor, F. J. Schlink, Washington, New Jersey. 2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Consumers' Research, Inc., a non-profit corporation, not a business enterprise, not operated for profit, Washington, New Jersey. Stock—none. 3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None. 4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. F. J. Schlink. Sworn to and subscribed before me this 24th day of September 1945. Rueben D. Stevens. (My commission expires June 23, 1948.)

ful, for governmental operations tend to increase in mass and ponderousness, and always in expensiveness, because government officials do not dare to use a firm hand in holding down costs.

The problem of staving off inflation is best met by abundant production of needed consumers' goods, under a strongly competitive system of manufacture and distribution where manufacturers and dealers compete both on price and on service. With the large number of companies now straining every energy to get into peacetime production on a normal basis and with some already in production but unable to market their wares because of governmental red-tape and administrative delays of various kinds, the consumer's best means of getting action will apparently be to urge his congressman to remove various governmental obstructions, including the OPA's operations, from the way of progress and let refrigerators, washing machines, toasters, and other long-needed appliances roll off the production lines into the dealers' sales rooms. If these wares are priced too high at the beginning—and many probably will be—it is safe to assume that competitive activity will dispose of the too-high-profit producers in a fairly short time. It has often happened before, and in any event it is a better regulator of excessive profit tendencies than the slow, insensitive, and heavy hand of government.

Binders for CR's Bulletins

THE FOLLOWING BINDERS, suitably imprinted for Consumers' Research material are available to subscribers at cost plus a small handling and mailing charge:

Black Fiberboard Binder

A durable, fiberboard binder, with *Acco*-type metal fastener for securing the BULLETINS. 35c postpaid (Canada, 45c). This binder can be used only with BULLETINS that are drilled or punched (2 holes needed).

Imitation-Leather, Non-Flexible-Cover Binder

Uses simple device of straight wires for securing the BULLETINS, and does not require that they be punched or drilled. $1.25 postpaid (in Canada, $1.50, on account of extra postage and clerical work due to customs papers). The wire-type binder has two advantages: it permits the BULLETINS to open flat, and it reduces wear on them—important when they are much handled and frequently referred to.

Either type of binder easily holds a full year's issues of CR's BULLETINS. The fiberboard binder is thinner than the other but will hold 18 of the monthly issues.

Abridged Cumulative Index of Previous 1945 Issues Consumers' Research Bulletins

Month and Page

Anti-tarnish preparations†.....June, 24-25
Athlete's foot, treatment.....Oct., 4
Automobiles, poor acceleration.....Oct., 29

Baby oils†.....May, 11-12
supplies, sterilization.....Oct., 26
Batteries, automobile storage†...Oct., 13-16
flashlight, rechargeable†.....Aug., 21-22
Beans, baked†.....July, 7-8
Beef, cooking grass-fed.....Oct., 29
Beer and ale, vitamin content.....Sept., 4
Bouillon cubes and broth extracts†.....Mar., 21-23

Canned vegetables and fruits†...Apr., 10-16
Canners, pressure†.....May, 5-11
Canning, home, spoilage due to understerilization.....Oct., 29
Cementing materials, household†.....Aug., 15-16; 30
Cereals, breakfast, vitamin content†.....May, 21
Chocolate, baking and a chocolate syrup†.....May, 16-17
Cleaners, household (Penetone, Dri-Kleen, Evershine, Rad, Collins Lustre-Lac Polish)†.Sept., 12, 25, 30; Oct., 30
Cleansers and detergents, fabric and rug†.....July, 21-23
Closets, cedar-lined.....Sept., 4
Cola drinks†.....June, 9-10
Corrections and emendations to CR Bulletins†.....Jan., 24; Feb., 31; Mar., 11; May, 25; Oct., 25

D D T.....Oct., 5-8
Deodorants and anti-perspirants†.Oct., 9-12
Diet, reducing, it is not necessary to fat†.....Sept., 21-23
Dog feeding and dog foods.....Jan., 15-17†; Feb., 30
Dust cloths, home treatment.....Sept., 4

Editorial.....each issue, page 2
Engines, overpowered auto.....Sept., 17

Fading, gas and atmospheric, of some rayons.....Oct., 3
Film, photographic...Jan., 22-24†; Feb., 14-15†; Apr., 25; June, 21-22†; July, 16-21†
Army surplus†.....Aug., 17
hypersensitizing process†...Sept., 23-24
Food, colors for, and colored†...June, 11-14
quality from the soil.....Sept., 14-17
Gloves, women's fabric†.....Mar., 5-7

Hats, men's felt†.....Apr., 8-10
Hosiery, treating preparations†....June, 23-24; Sept., 13-14
Housing, how much to pay.....Jan., 5-9
prefabricated†.....Mar., 16-21

Irons, new electric†....Feb., 5-9; Apr., 16-18

Jams, preserves, jellies and marmalades†.....Sept., 18-21

Laundry, home unit stations (Bendix)†.....Oct., 4
Linoleum, care of†.....May, 22-24
lacquers and varnishes†.....Jan., 18-20

Mildew-proofing agents†.....July, 11-15
Mixed drinks, effects.....Oct., 30
Moth-treating product, ineffective (Dos-Tex Foam)†.....Sept., 30
Motion pictures†.....each issue

Nipples, rubber, nursing bottle†.Sept., 10-12

Observation Post†.....each issue, page 3
"Odor dispellers," new†.....Apr., 20-22
Olives, canned ripe†.....Aug., 9-10
Ovenware, glass†.....July, 5-6

Peanut butter†.....Mar., 12-13; Oct., 12-13
Pencils, colored leads for, and colored†.....Aug., 24, 31
Phonograph records†.....each issue
Photographic paper†.....Oct., 24

Raincoats, girls' and women's†....Apr., 5-8
men's†.....Mar., 8-11
"Refrig-O-Master"†.....Apr., 22-23
Rugs, Oriental†.....Feb., 15-18

Shoe trees, men's†.....Mar., 13-16
Shoes, men's dress†.....Sept., 5-10
Silver polishes and cleaners†.....May, 18-21
Soap flakes (Lux)†.....Oct., 25
Socks, men's†.....Aug., 5-8
Stop-leaks, automobile radiator and house-heating boiler†.....Aug., 18-20
Sunburn preventives†.....July, 9-11

Teeth, effects of acids in foods on.....Aug., 11-14
Thermometers, clinical†.....June, 19-21
Tire shortage.....Oct., 3
Tomato juice†.....Jan., 12-14
Toothbrushes†.....June, 5-8
Toothpaste (Ipana)†.....Aug., 3
Trace Elements—I.....Oct., 16-24

Vitamins and vitamin preparations....Jan., 3, 12-14; Feb., 3-4†; Mar., 4; Apr., 3; May, 21; Aug., 4, 20-21; Sept., 4, 30; Oct., 3

Washing powder for diapers (Diaperwite)†.....Sept., 25
Waxes, floor†.....May, 13-16

†indicates that listings of names or brands are included.

Ratings of Motion Pictures

THIS section aims to give critical consumers a digest of opinion from a number of reviews, ranging from the motion picture trade press to Parents' Magazine, which rates motion pictures not only on their quality as entertainment but on their suitability in various aspects for children.

It should be emphasized that the motion picture ratings which follow do not represent the judgment of a single person but are based on an analysis of the reviews appearing in some 19 different periodicals. (See January 1945 issue for the sources of the reviews.)

The figures preceding the title of the picture indicate the number of critics who have been judged to rate the film A (recommended), B (intermediate), and C (not recommended).

Audience suitability is indicated by "A" for adults, "Y" for young people (14-18), and "C" for children, at the end of each line.

Descriptive abbreviations are as follows:

adv—adventure
biog—biography
c—in color (Technicolor or Cinecolor)
car—cartoon
com—comedy
cri—crime and capture of criminals
doc—documentary
dr—drama
fan—fantasy
hist—founded on historical incident
mel—melodrama
mus—musical
mys—mystery
noe—dramatization of a novel
rom—romance
soc—social-problem drama
trav—travelogue
war—dealing with the lives of people in wartime
wes—western

A	B	C		
—	3	3	**Abbott and Costello in Hollywood**	*mus-com AYC*
—	3	5	**Adventures of Rusty**	*dr AYC*
—	12	5	**Affairs of Susan, The**	*com A*
1	11	4	**Along Came Jones**	*wes AYC*
6	8	—	**Anchors Aweigh**	*mus-com-c AYC*
—	6	1	**And Then There Were None**	*cri-mys A*
—	1	3	**Apology for Murder**	*cri-dr A*
—	4	2	**Arson Squad**	*cri-mel AYC*
—	11	4	**Back to Bataan**	*war-dr A*
—	1	3	**Barge-Keeper's Daughter, The**	*com A*
—	4	6	**Beautiful Cheat, The**	*mus-com A*
—	5	8	**Bedside Manner**	*com A*
—	1	3	**Behind City Lights**	*dr A*
6	7	2	**Bell for Adano, A**	*war-dr A*
—	6	—	**Bells of Rosarita, The**	*mus-wes AYC*
—	5	9	**Bewitched**	*dr A*
—	2	2	**Beyond the Pecos**	*wes AYC*
—	2	1	**Blithe Spirit**	*com-c A*
—	2	6	**Blonde from Brooklyn**	*mus-com A*
—	—	9	**Blonde Ransom**	*mus-com A*
1	12	1	**Blood on the Sun**	*war-mel A*
—	—	3	**Border Badmen**	*wes AYC*
—	2	5	**Boston Blackie's Rendezvous**	*mel A*
—	1	2	**Both Barrels Blazing**	*mus-wes AYC*
—	11	3	**Brewster's Millions**	*com A*
—	9	4	**Brighton Strangler, The**	*cri-mel A*
—	2	10	**Bullfighters, The**	*com A*
6	6	4	**Captain Eddie**	*biog-dr AYC*
—	4	3	**Captain Kidd**	*mel AYC*
—	5	9	**Caribbean Mystery, The**	*mys-mel A*
—	—	5	**Castle of Crimes**	*mys-mel A*
—	7	4	**Cheaters, The**	*dr AYC*
—	7	8	**China Sky**	*war-mel A*
—	4	4	**China's Little Devils**	*war-mel A*
—	7	8	**Christmas in Connecticut**	*com A*
—	6	5	**Circumstantial Evidence**	*cri-mel A*
—	1	4	**Cisco Kid Returns**	*wes AYC*
1	14	1	**Clock, The**	*war-rom A*
—	—	—	**Col. Blimp (See Life and Death of)**	
—	2	3	**Come Out Fighting**	*com AYC*
2	9	3	**Conflict**	*cri-mel A*
5	5	6	**Corn Is Green, The**	*dr A*
—	2	1	**Corpus Christi Bandits**	*wes AYC*
—	10	6	**Counter-Attack**	*war-dr A*
—	—	3	**Crazy Knights**	*cri-mel AYC*
—	5	4	**Crime Doctor's Courage, The**	*mys-dr A*
—	5	3	**Crime, Inc.**	*cri-mel AYC*
—	2	3	**Dangerous Intruder**	*cri-mys A*
—	6	2	**Dangerous Partners**	*mel A*
—	2	6	**Dangerous Passage**	*mel A*
—	1	2	**Dawn Over France**	*hist-dr A*
—	—	—	**Dear Octopus (See Randolph Family)**	
—	5	8	**Delightfully Dangerous**	*mus-com A*
1	11	4	**Diamond Horseshoe**	*mus-com-c A*
—	7	8	**Dillinger**	*cri-mel A*
—	3	5	**Divorce**	*dr A*
—	3	3	**Docks of New York**	*cri-mel AYC*
—	4	1	**Dolly Sisters**	*mus-com-c A*
—	5	11	**Don Juan Quilligan**	*com A*
—	5	5	**Double Exposure**	*cri-com A*
1	11	2	**Duffy's Tavern**	*mus-com A*
—	5	6	**Eadie Was a Lady**	*mus-com A*
—	6	7	**Earl Carroll Vanities**	*mus-com A*
—	3	4	**Easy to Look At**	*mus-com AYC*
3	6	5	**Enchanted Cottage, The**	*dr A*
—	3	—	**Enchanted Forest, The**	*fan-c AYC*
—	2	1	**Enemy of the Law**	*mus-wes AYC*
—	2	10	**Escape in the Desert**	*war-mel A*
—	3	4	**Escape in the Fog**	*war-mys A*
—	3	4	**Eve Knew Her Apples**	*mus-com A*
—	3	6	**Falcon in San Francisco**	*cri-mys A*
—	1	5	**Fall of Berlin**	*war-doc A*
—	1	5	**Fashion Model**	*cri-mel AYC*
—	—	5	**Fatal Witness, The**	*cri-mel A*
—	4	3	**Fighting Guardsman, The**	*adv A*
—	5	3	**First Yank into Tokyo**	*war-dr A*
—	11	4	**Flame of Barbary Coast**	*mus-mel A*
—	1	4	**Flame of the West**	*wes A*
—	4	3	**Follow That Woman**	*cri-mel A*
—	5	6	**Forever Yours**	*dr AYC*
—	3	8	**Frozen Ghost, The**	*mys-mel A*
—	4	6	**G. I. Honeymoon**	*war-com A*
—	1	4	**Gangs of the Waterfront**	*cri-mel AYC*
—	1	2	**Gangster's Den**	*wes AYC*
—	4	4	**Gay Senorita, The**	*mus-com AYC*
—	6	4	**George White's Scandals**	*mus-com A*
—	4	2	**Girl No. 217**	*war-dr A*
—	1	3	**Girl of the Limberlost**	*mel AYC*
2	7	3	**God is My Co-Pilot**	*war-dr AY*
—	5	5	**Great Flamarion, The**	*cri-mel A*
—	8	4	**Great John L., The**	*mus-mel A*
—	8	2	**Grissly's Millions**	*cri-mys A*
1	7	3	**Guest Wife**	*com A*
—	5	3	**Guy, a Gal, and a Pal, A**	*rom A*
—	2	3	**Half-Way House, The**	*fan A*
—	13	3	**Hangover Square**	*cri-mel A*
—	4	10	**Having Wonderful Crime**	*cri-com A*
—	4	4	**Her Highness and the Bellboy**	*rom AYC*
—	1	9	**Her Lucky Night**	*mus-com AYC*
—	9	5	**Here Come the Co-eds**	*mus-com AYC*
—	9	5	**Hidden Eye, The**	*cri-mys AYC*
—	3	7	**High Powered**	*mel A*
—	3	5	**Hitchhike to Happiness**	*mus-com AYC*
—	5	1	**Hollywood and Vine**	*com AYC*
—	2	5	**Honeymoon Ahead**	*mus-com A*
—	6	8	**Horn Blows at Midnight, The**	*com A*
1	9	3	**Hotel Berlin**	*war-mel A*
—	8	4	**House of Fear**	*mys-mel AYC*
1	1	9	**House of Frankenstein**	*cri-mel A*
3	5	—	**House on 92nd St., The**	*war-mel AYC*

A	B	C		
—	2	4	**I Love a Bandleader**	*mus-dr AYC*
—	6	2	**I Love a Mystery**	*mys A*
1	6	3	**Identity Unknown**	*war-dr AYC*
—	3	8	**I'll Remember April**	*mus-dr A*
—	4	5	**I'll Tell the World**	*mus-com AYC*
2	12	2	**Incendiary Blonde**	*mus-mel A*
1	4	6	**Isle of the Dead**	*mys-mel A*
—	8	7	**It's a Pleasure**	*mus-com-c A*
1	13	2	**It's in the Bag**	*cri-com AYC*
—	—	7	**Jade Mask, The**	*mys-mel A*
—	4	9	**Jealousy**	*mys-mel A*
—	—	—	**John Dillinger (See Dillinger)**	
—	10	2	**Johnny Angel**	*mys-mel A*
—	2	9	**Jungle Captive**	*mel A*
2	12	1	**Junior Miss**	*com AYC*
—	5	10	**Keep Your Powder Dry**	*war-dr A*
—	1	4	**Kid Sister, The**	*com A*
1	5	—	**Kiss and Tell**	*com A*
—	2	6	**Lady Confesses, The**	*cri-mel A*
—	4	6	**Lady on a Train**	*mys-com A*
—	3	3	**Last Hill, The**	*war-dr A*
—	—	3	**Law of the Valley**	*wes AYC*
—	7	3	**Leave It to Blondie**	*com AYC*
—	4	5	**Let's Go Steady**	*mus-com AYC*
6	8	2	**Life and Death of Col. Blimp**	*war-dr-c A*
—	2	1	**Lone Texas Ranger, The**	*mus-wes AYC*
—	5	3	**Lost Weekend, The**	*nov A*
—	1	6	**Love, Honor and Goodbye**	*com A*
2	10	3	**Love Letters**	*war-dr A*
—	2	6	**Mama Loves Papa**	*com A*
—	7	—	**Man from Oklahoma**	*mus-wes AYC*
—	1	6	**Man Who Walked Alone**	*war-com A*
—	3	3	**Marked Trails**	*wes AYC*
2	13	—	**Medal for Benny, A**	*dr A*
—	2	7	**Men in Her Diary**	*com A*
1	4	3	**Mildred Pierce**	*dr A*
—	2	3	**Military Secret**	*war-mel A*
—	1	6	**Missing Corpse, The**	*cri-com A*
—	13	2	**Molly and Me**	*mus-com A*
3	7	4	**Mr. Emmanuel**	*war-dr A*
—	3	2	**Muggs Rides Again**	*mel AYC*
—	4	5	**Mummy's Curse, The**	*mys-mel A*
—	7	7	**Murder, He Says**	*cri-com A*
—	6	9	**Naughty Nineties, The**	*mus-com AYC*
—	3	—	**Navajo Trail, The**	*wes AYC*
—	7	7	**Nob Hill**	*mus-dr-c A*
5	6	2	**Objective, Burma**	*war-mel A*
1	4	5	**On Approval**	*com A*
—	5	3	**On Stage Everybody**	*mus-com AYC*
—	3	6	**One Exciting Night**	*cri-com A*
1	11	—	**Our Vines Have Tender Grapes**	*dr AYC*
1	12	3	**Out of This World**	*mus-com A*
—	9	4	**Over 21**	*com A*
1	8	7	**Pan-Americana**	*mus-com A*
1	4	—	**Pardon My Past**	*com A*
—	6	2	**Paris Underground**	*war-mel A*
1	9	3	**Patrick the Great**	*mus-com AYC*
—	1	9	**Penthouse Rhythm**	*mus-com A*
—	2	4	**Phantom of 42nd St., The**	*cri-mel A*
—	5	3	**Phantom Speaks, The**	*mys-mel A*
—	8	9	**Picture of Dorian Gray, The**	*dr A*
—	8	7	**Pillow to Post**	*war-com A*
—	2	7	**Power of the Whistler**	*mys-mel A*
—	10	2	**Pride of the Marines**	*war-dr A*
—	3	6	**Radio Stars on Parade**	*mus-com AYC*
—	5	5	**Randolph Family, The**	*com A*
—	2	1	**Return of the Durango Kid, The**	*mus-wes AYC*
8	3	4	**Rhapsody in Blue**	*mus-biog AYC*
—	—	5	**Rhythm Round-Up**	*mus-wes AYC*
—	1	4	**River Gang**	*mel A*
—	2	4	**Road to Alcatraz**	*cri-mys AYC*
—	—	5	**Rockin' in the Rockies**	*mus-wes AYC*
—	—	6	**Rogues Gallery**	*cri-mel A*
—	1	9	**Rough, Tough, and Ready**	*war-com A*
1	7	7	**Roughly Speaking**	*dr A*
1	10	7	**Royal Scandal, A**	*com A*
—	—	3	**Rustlers of the Badlands**	*mus-wes AYC*
—	—	—	**Rusty (See Adventures of)**	
—	5	10	**Salome, Where She Danced**	*mus-dr-c A*
1	9	7	**Salty O'Rourke**	*mel A*
—	3	1	**Sante Fe Saddlemates**	*wes AYC*
—	—	7	**Scared Stiff**	*mys-com AYC*
—	3	4	**Scarlet Clue, The**	*mys-mel A*
—	4	10	**See My Lawyer**	*mus-com AYC*
—	5	—	**Shady Lady**	*mus-dr A*
—	1	4	**Shanghai Cobra, The**	*cri-mys A*
—	2	1	**Shanghai Drama, The**	*mel A*
—	4	4	**She Gets Her Man**	*cri-com AYC*
1	6	—	**Silver Fleet, The**	*war-mel A*
2	5	7	**Son of Lassie**	*war-mel-c AYC*
—	2	5	**Song for Miss Julie, A**	*mus-com A*
—	—	10	**Song of the Sarong, The**	*mus-adv A*
1	7	4	**Southerner, The**	*soc-dr A*
—	2	3	**Spell of Amy Nugent, The**	*mel A*
—	1	2	**Springtime in Texas**	*mus-wes AYC*
3	10	1	**State Fair**	*mus-com-c AYC*
—	1	5	**Steppin' in Society**	*com A*
5	8	1	**Story of G. I. Joe**	*war-dr AYC*
—	—	—	**Strange Affair of Uncle Harry (See Uncle Harry)**	
—	6	2	**Strange Illusion**	*cri-mel AY*
—	1	2	**Stranger from Santa Fe**	*wes AYC*
—	6	8	**Sudan**	*mus-mel-c A*
—	—	9	**Swing Out, Sister**	*mus-com A*
—	3	6	**Swingin' On a Rainbow**	*mus-com A*
—	2	6	**Tahiti Nights**	*mus-com A*
—	5	6	**Tarzan and Amazons**	*adv AYC*
—	4	2	**Tell It to a Star**	*mus-com A*
—	2	8	**Ten Cents a Dance**	*mus-com A*
—	2	1	**That Night With You**	*mus-com A*
1	8	—	**That's the Spirit**	*mus-fan A*
—	1	4	**There Goes Kelly**	*mus-com AYC*
—	2	3	**They Came to a City**	*fan A*
—	—	—	**They Shall Have Faith (See Forever Yours)**	
—	8	8	**Those Endearing Young Charms**	*war-rom A*
1	12	1	**Thousand And One Nights, A**	*mus-fan-c AYC*
—	—	3	**Three in the Saddle**	*mus-wes AYC*
—	2	4	**Three's a Crowd**	*cri-mel A*
2	10	4	**Thrill of a Romance**	*mus-com-c A*
1	13	1	**Thunderhead, Son of Flicka**	*wes-dr-c AYC*
1	12	5	**Tonight and Every Night**	*war-mus-com-c A*
7	10	—	**Tree Grows in Brooklyn, A**	*dr AY*
—	—	3	**Trouble Chasers**	*com A*
4	3	—	**True Glory, The**	*war-doc A*
—	8	3	**Twice Blessed**	*com A*
—	3	7	**Two O'clock Courage**	*cri-mel A*
—	8	5	**Uncle Harry**	*cri-mel A*
—	6	9	**Unseen, The**	*mys-mel A*
—	2	1	**Ural Front, The**	*war-dr A*
—	5	3	**Utah**	*mus-wes AYC*
3	10	1	**Valley of Decision, The**	*dr A*
—	1	8	**Vampire's Ghost, The**	*mys-mel A*
—	2	7	**Wait for Me**	*war-dr A*
2	10	1	**Way Ahead, The**	*war-dr A*
—	2	3	**We Accuse**	*war-doc A*
2	8	—	**Weekend at the Waldorf**	*mus-com A*
—	5	3	**What a Blonde**	*com A*
1	13	1	**Where Do We Go from Here?**	*mus-fan-c A*
—	1	4	**White Pongo**	*mel AYC*
—	3	5	**Why Girls Leave Home**	*mus-mel A*
—	2	2	**Wildfire**	*wes-c AYC*
—	4	6	**Within These Walls**	*soc-dr A*
—	12	2	**Without Love**	*rom A*
—	9	4	**Woman in Green, The**	*mys-mel AYC*
3	12	1	**Wonder Man, The**	*mus-com-c A*
—	10	2	**You Came Along**	*war-mus-dr AYC*
—	2	2	**You Can't Do Without Love**	*mus-mys AYC*
—	—	3	**Youth Aflame**	*dr A*
—	4	5	**Youth on Trial**	*dr A*
2	3	—	**Ziegfeld Follies**	*mus-com-c A*
—	1	9	**Zombies on Broadway**	*com A*
—	—	8	**Zoya**	*war-dr A*

The Consumers' Observation Post

[Continued from page 4]

THE NEW CHIP, FLAKE, AND POWDERED SOAP now on the market has had its soap content "stretched" by the addition of "builders" or "water-softening" materials in accordance with requirements of the Department of Agriculture. Although the domestic supply of fats and oils is said to be improving, soap manufacturers have been put at the bottom of the official priority list of users of fats and oils. One business paper predicts that it will be nearly a year before washing and cleaning soaps of pre-war quality are again available in quantity.

* * *

TWO-WAY STRETCH GIRDLES that women are anxiously awaiting are due to make their appearance in the stores about the first of the year. There have been some two-way stretch girdles available made with neoprene synthetic rubber, but according to one business journal, these have not been completely satisfactory because they don't have as much stretch as girdles made with natural rubber. Shortage of fine cotton yarns for winding the rubber threads is considered the chief cause of the delay in the reappearance of pre-war-quality girdles.

* * *

FAT-BACK is the meat chiefly wanted for UNRRA's program of feeding the people of Poland, Czechoslovakia, Greece, Yugoslavia, Italy, and Albania, according to that organization's deputy administrator. Fat-back is the strip along the top of a loin of pork that is customarily trimmed off and rendered for lard. It is also much used as a favorite article of food in southern states of the U.S. Most U.S. consumers, however, will no doubt feel that the sharing of supplies of this type of meat would not entail any great sacrifice. The federal government's propaganda for giving away of American food supplies too often has given the impression that it is necessary for us to forego choice cuts of beef and butter, in order to stave off possible revolutionary upheavals abroad. As Professor Robert S. Harris, well-known nutrition researcher at M.I.T., has wisely pointed out, the nutrition problems of other nations will not be solved if the American officials impose our foods and our food habits upon them; that our aid will be most constructive if we supply the knowledge and skills to help them get and utilize to best advantage the things they need.

Talking it over

makes a difference

when you consult CR's new *Annual Cumulative Bulletin!*

YOU DON'T NEED to rely on conflicting sales claims or what "a friend said." When deciding on what brand to buy, be advised by CR's new 200-page *Annual Cumulative Bulletin* which summarizes a wide range of CR's previous findings, together with much new material, in the fields of FOODS, HOUSING AND HOME MAINTENANCE, HEATING EQUIPMENT AND FUEL, AUTOMOBILES, TEXTILES AND CLOTHING, MEDICINE AND HYGIENE, COSMETICS AND TOILET SUPPLIES, and HOUSEHOLD APPLIANCES. Some two thousand products are rated by brand name as *A. Recommended, B. Intermediate,* or *C. Not Recommended.*

To order your copy, use the handy order blank on the next page!

MEN'S UNDERWEAR, currently hard to find, might be plentiful if, by some magic or other, olive drab could be made a fashionable color. Army rejects and surpluses could be used in the present period of shortage before full production gets under way. The sad news from the dye experts is that there is no known method for removing the olive drab color to permit redyeing.

* * *

NEW PRODUCTS: "Wigder" (25c) is a type of fingernail clipper which used to be widely sold in 10-cent stores and is now again available in some stores of this class. This type has been used over a long period and found to be quite satisfactory, though it is not as well finished or compact as some of the higher-priced brands that used to be sold in drugstores. The "Wigder" is nickel plated and has file teeth on the reverse of the handle or lever by which the clipper is operated.

Libbey Heat-Treated Tumblers (Libbey Glass, Div. Owens-Illinois Glass Co., Toledo 1, Ohio) are now available in three sizes. Prices listed in Sears Midsummer catalog were 93c, 97c, and $1.33 (plus postage) for one dozen 5-oz., 9-oz., and 12-oz. sizes respectively. Among the claims made for them are: They "stand knocks, falls, extremes of hot and cold," "they last 3 to 5 times longer than ordinary tumblers," "You'll be amazed when you see how Heat-Treated Tumblers take rougher than ordinary handling, yet remain intact, unchipped." One advertisement shows a Libbey glass falling from a tray carried by a child and bouncing unbroken after it strikes the floor or the ground.

In order to discover whether these glasses really lived up to their claims, CR had a number purchased and subjected them to impact tests, together with ordinary glasses, used as controls. The glasses were tested for breakage by dropping them empty on three types of floors, and on two types of floors with 4 ounces of water in them, from a uniform height of 30 inches—the height of a standard table.

The Libbey glasses did not break when dropped, either full or empty, on rugs laid on concrete or on wooden floors over which was laid felt-base floor covering material (imitation linoleum)—but neither did the ordinary glasses, purchased at a five-and-dime store at 3 for 10c. The Libbey glasses did show superior strength, however, when dropped on bare concrete, by a ratio of 3 to 1, approximately. (In testing both sets of glasses, some of the failures were secondary, in that the glasses broke on the bounce.) The conclusions drawn from CR's tests were that the Libbey Heat-Treated glasses at 93c a dozen are stronger—as they obviously should be considering their 130% higher price—than the run-of-the-mill glasses tested for comparison (40c a dozen). It should be borne in mind, however, that the Libbey glasses, contrary to the implications many readers of Libbey's claims will receive from the advertising, will break at times, when dropped. They will, however, be much more likely to survive severe shocks, as by a fall on stone or concrete.

Consumers' Research, Inc.
Washington, N. J.

Please enter my order as checked. It is understood that my handling of any CR material which is marked "The analyses of commodities, products, or merchandise appearing in this issue of the Consumers' Research Bulletin are for the sole information of Consumers' Research subscribers" will be in accordance with that direction.

NAME_____
(PLEASE SIGN IN LONGHAND)

STREET_____

CITY & ZONE_____ STATE_____

BUSINESS OR PROFESSION_____

CR-11-45

Please check one:

☐ **I enclose $4 (Canada & foreign, $4.50) for one year's subscription to Consumers' Research Bulletin monthly (12 issues) AND the new 1945-46 Annual Cumulative Bulletin.**

☐ **I enclose $3 (Canada & foreign, $3.50) for one year's subscription to Consumers' Research Bulletin monthly (12 issues).**

☐ **I enclose $2.50 (Canada & foreign, $2.75) for a subscription to the 1945-46 Annual Cumulative Bulletin alone.**

☐ **I enclose $1.00 (Canada & foreign, $1.25) for a copy of the 1945-46 Annual Cumulative Bulletin. Since I am a subscriber to Consumers' Research Bulletin (12 issues), I am entitled to the special rate.**

PHONOGRAPH RECORDS

By Walter F. Grueninger

Please Note: Prices quoted do not include taxes. In the ratings AA indicates highly recommended; A, recommended; B, intermediate; C, not recommended.

SOME of the new and re-issued record sets recommended in 1945 may offer a guide to Christmas giving if you keep in mind the tastes of the recipient.

I should like friends of mine to give me any of the following sets in the orchestral and concerto fields. Sets in other categories will appear next month.

- **Mozart**—*Concerto No. 24*, Columbia Set 356, $4.50; *Symphony No. 34*, Columbia Set 548, $3.50; *Symphony No. 41*, Columbia Set 565, $4.50.
- **Brahms**—*Symphony No. 4*, Columbia Set 567, $5.50; *Concerto No. 2*, Victor Set 740, $6.50.
- **Boccherini**—*Scuola di Ballo*, Columbia Set X157, $2.50.
- **Tschaikovsky**—*Symphony No. 6*, Columbia Set 558, $5.50.
- **Gershwin**—*Rhapsody in Blue*, Columbia Set X251, $2.50.
- **Lalo**—*Symphonie Espagnole*, Columbia Set 564, $3.50.
- **Bach**—*Concerto for Two Violins*, Columbia Set X253, $2.50.
- **Strauss**—*Till Eulenspiegel*, Victor Set DV1, $4.50.
- **Mendelssohn**—*Concerto in E Minor*, Columbia Set 577, $4.50.

ORCHESTRA

Barber: *Symphony No. 1.* Philharmonic-Symphony Orchestra of New York under Bruno Walter. 4 sides, Columbia Set X252. $2.50. Interesting one movement symphony composed a decade ago by a young American and since played the world over.
Interpretation AA
Fidelity of Recording AA

Rimsky-Korsakov: *Le Coq D'Or*—Suite. Minneapolis Symphony under Mitropoulos. 4 sides, Columbia Set X254. $2.50. A suite of excerpts from the opera arranged by Glazounov and Steinberg but apparently there are cuts not found in the six side Victor Set 504. Minus the glitter of the stage the music seems dull. Performers are competent but not as good as in the Victor set. The recording of this new set is the best to date from Minneapolis and superior to that of the Victor set.
Interpretation A
Fidelity of Recording AA

Strauss: *Till Eulenspiegel.* Boston Symphony Orchestra under Koussevitzky. 4 sides, Victor Set DV1. $4.50. A favorite tone poem depicting the merry pranks of *Till Eulenspiegel.* First of Victor's new releases on plastic. Virtuoso performance tops all competitors.
Interpretation AA
Fidelity of Recording AA

Thomson: *Five Portraits.* The Philadelphia Orchestra under Virgil Thomson. 4 sides, Columbia X255. $2.50. The composer's friends sit for a musical portrait. Here are five which, I fear, are not worth repeated hearing.
Interpretation AA
Fidelity of Recording AA

CONCERTO

Bach: *Concerto for Two Violins.* Adolf Busch and Frances Magnes (violins) and the Busch Chamber Players. 4 sides, Columbia Set X253. $2.50. Marvelously integrated performance of the most popular composition for two violins. Tops all rival sets.
Interpretation AA
Fidelity of Recording AA

Mendelssohn: *Concerto in E Minor.* Nathan Milstein (violin) and the Philharmonic-Symphony Orchestra of New York under Bruno Walter (7 sides) & *Midsummer Night's Dream*—Scherzo played by the Orchestra (1 side). Columbia Set 577. $4.50. Clearly among the year's highspots. The concerto is one of the most ingratiating composed for violin. Soloist, orchestra, and technicians contribute their best with the result that it is the set to buy. However, I shall not part with my old Columbia Set 190 in which Szigeti plays this music with rare insight.
Interpretation AA
Fidelity of Recording AA

VOCAL

Wagner: *Tristan und Isolde*—Excerpts. Helen Traubel (soprano) and the Philharmonic-Symphony Orchestra of New York under Rodzinski. 10 sides, Columbia Set 573. $5.50. Presented are the Prelude to Act I (orchestra, 3 sides), Isolde's Narrative from Act I (Traubel, 3 sides), Prelude to Act III (orchestra, 2 sides) and *Liebestod* (Traubel, 2 sides). No other set covers precisely the same ground. Wide range recording offers a commendable balance between voice and orchestra, so rare yet particularly important in Wagnerian works. Superior Wagner are the Traubel discs, thanks to soloist and orchestra. The orchestra's Prelude to Act I, however, does not achieve the dignity found in Victor Set 653 nor does the Prelude to Act III convey the sadness found in Columbia 69805.
Interpretation A
Fidelity of Recording AA

French Operatic Arias. Martial Singher (baritone). 8 sides, Columbia Set 578. $4.50. Polished, but singing which some listeners may regard as "dry" and lacking in "oomph." Included are arias from *The Damnation of Faust, Romeo et Juliette, Hamlet, Tales of Hoffman, Carmen*, etc.
Interpretation A
Fidelity of Recording AA

Marjorie Lawrence Sings for the Boys (soprano). 6 sides, Columbia Set 579. $3.50. What a boon to have these beloved songs, sung by Miss Lawrence to GI's, recorded for civilians. A set that touches the heart. Included are *Annie Laurie, The Lord's Prayer, Danny Boy, My Hero*, etc.
Interpretation AA
Fidelity of Recording AA

Lily Pons Program (soprano). 6 sides, Columbia Set 582. $2.75. Standard florid arias designed to show off technical dexterity. Old timers will be reminded of a previous generation's superiority, but on the whole Miss Pons surmounts most obstacles. Included are the Proch—*Theme and Variations*, Verdi's *Caro Nome*, David's *Charmant Oisseau.*
Interpretation A
Fidelity of Recording AA

INSTRUMENTAL

Beethoven: *Sonata Op. 30 No. 2* (7 sides) & *Rondo in G* (1 side). Yehudi and Hephzibah Menuhin (violin & piano). Victor Set 1008. $4.50. The military spirit pervades this sonata which some critics consider fine, others non-important. Neither performance nor recording which was made in Europe some years ago surpass that of the Busch-Serkin, Victor Set 283.
Interpretation B
Fidelity of Recording B

Russian Music for Two Pianos. Vronsky & Babin (duo-pianists). 6 sides, Columbia Set 576. $3.50. Out of six compositions, two were written for duo-pianos. The others were arranged by Babin from orchestrations. The only number I find worth repeated hearing is the charming Arensky Waltz on disc 71672. The recording, on very few occasions, favors the bass. Performance—topnotch. Included, too, are Rimsky-Korsakov's *Cradle Song* and *Dance of the Tumblers*, Stravinsky's *Tango* and *Circus Polka*, Babin's *Russian Village.*
Interpretation AA
Fidelity of Recording AA